REVIEW

OF

FOREST ADMINISTRATION

IN

BRITISH INDIA

FOR THE YEAR

1889-90.

BY

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REVIEW

OF

FOREST ADMINISTRATION IN BRITISH INDIA

FOR THE YEAR 1889-90.

SUMMARY.

THE working of the Department during the year under review may be broadly summarized as follows:—The total area of forest estates under control was increased during the year by 4,254 square miles, of which 2,909 square miles are either Reserved or Protected forests. The total area of forest lands on the books of the Department at the close of the year amounted to 105,445 square miles, and of this, 85,890 square miles are managed under Forest Acts or Regulations. Fire protection was successful over 22,241 square miles of forests, principally reserves, and an area of 49,253 acres was planted or sown with forest species. Rupees 2,83,829 were spent on buildings or lines of export for material in connection with the improvement of the forests. Timber and fuel, amounting to 153,168,882 cubic feet, were removed from the forests during the year. Minor produce of the gross value of R33,66,804 was also extracted. The gross revenue for the year amounted to R1,53,03,572, and the expenditure to R80,12,518. The surplus amounted to R72,91,054 as against R57,68,690, in the year 1888-89.

CHAPTER I.

EXTENSION AND ORGANIZATION OF THE FOREST AREA.

I.—Alterations of Area.

2. The area under the control of the Forest Department over the whole of India amounted to 105,445 square miles at the close of the year under review. The following table indicates the distribution of this area amongst the Provinces concerned :—

Province.		Forest Area, in square miles.				Proportion of Forests to whole area of Province.	Remarks.
Name.	Area, in square miles.	Reserved.	Protected.	Unclassed State.	Total.		
						Per cent.	
Bengal . .	150,689	5,195	2,239	4,033	11,467	*8	* The percentage is based on the area of the Province as entered in the Administration Report of 1888-89, which does not agree with the area stated in the Resolution by His Honour the Lieutenant-Governor on the Forest Administration Report for 1889-90.
North-Western Provinces and Oudh.	107,441	†3,591	67	132	3,790	4	† Includes 78 square miles of *Leased* Forests.
Punjab . .	106,613	‡1,694	358	§3,920	5,972	6	‡ Includes 321 square miles of *Leased* Forests.
Central Provinces .	86,501	19,708	...	318	20,026	23	§ Includes 255 square miles of *Leased* Forests.
Burma (Lower) .	87,220	‖5,574	...	...	5,574	7	‖ Includes 430 square miles of *Taungya* areas.
Burma (Uppe .	...	...	8,895	35	8,930	...	
Assam . . .	45,350	3,472	932	5,597	10,001	22	
Coorg . . .	1,581	241	615	...	856	54	
Ajmere . .	2,711	139	...	¶8	147	5	¶ This area, which is not brought under the Ajmere Forest Regulation, is managed by the Ajmere Forest Department.
Baluchistan . .	...	...	...	39	39	...	
Andamans . .	1,989	...	...	1,959	1,959	98	
Total .	590,095	39,614	13,106	16,041	68,761	**10	** Upper Burma and Baluchistan left out of account.
Berar . . .	17,711	2,072	...	2,244	4,316	24	
Total Bengal Presidency . .	607,806	41,686	13,106	18,285	73,077	**11	†† Exclusive of the areas of Feudatory and Tributary States, Zemindaries, and whole Inam villages.
Madras . .	††84,575	‡‡4,081	12,193	1,270	17,544	20	
Bombay . .	124,352	10,339	4,485	...	14,824	12	
Grand Total .	816,733	56,106	29,784	19,555	105,445	**12	‡‡ Includes 192 square miles of *Leased* Forests.

3. The net increase in the area controlled during the year by the Department was 4,254 square miles, distributed as under :—

Province.	Alterations in area in square miles, during 1889-90								Remarks.
	Reserved Forests.		Protected Forests.		Unclassed State Forests.		Total.		
	Increase.	Decrease.	Increase.	Decrease.	Increase.	Decrease.	Increase.	Decrease.	
Bengal	207	...	...	25	*	...	182	...	* Certain forests were made over for management by the Department, but their area is not known
North-Western Provinces and Oudh	...	5	...	2	...	...	...	7	
Punjab	158	...	...	146	5	...	17	...	
Central Provinces		4	...	...	...	7	..	11	
Burma (Lower)	463		...	..	...	...	463	..	
Burma (Upper)	...	.	791		...	...	791	...	
Assam	25	..	.	5		44	...	24	
Coorg	...	...	..	2	...	...	...	2	
Ajmere		...	...	...	†8	...	8	...	† Not brought under the Ajmere Forest Regulation, but managed by the Ajmere Forest Department
Baluchistan	...	...	..	...	..	...	.	..	
Andamans	...	.	...	.	‡1,959	...	1,959	..	‡ Not a true increase for the year Now shown for the first time.
Net Total Increase or Decrease	844	..	611	...	1,921	..	3,376	...	
Berar	534	.	...	...	...	371	163	...	
Net Total Increase or Decrease, Bengal Presidency	1,378		611		1,550	...	3,539	..	
Madras	304	.	490	...	...	205	589	...	
Bombay	101	...	25	...	...	...	126		
Grand net Total Increase or Decrease	1,783	..	1,126	..	1,345	...	4,254	...	

As in the preceding year, large true additions to the area of gazetted forests were made in Burma and Madras, being the result of forest settlement in progress. As explained below, the increase of 101 square miles of Reserved Forests in the Bombay Presidency was mainly due to corrections in the records. The large addition to the area of Reserved Forest in Berar was the result of reclassification of areas. The remaining main changes of area, such as those in the Punjab and in the Andamans, are more nominal than real. In the case of the latter, the total forest area was recorded for the first time in the year under review. True progress as regards areas under forest management must be measured by the additions to the area of Reserved Forests, which alone can be regarded as permanent and regularly constituted forest estates. Progress in this direction has been satisfactory, there having been a net addition over the whole of India of 1,783 square miles to the area under this class, during the year under review.

4. *Bengal*—The Reserved area was increased during the year by 207 square miles, while 25 square miles of Protected Forests in the Sundarbans were given up for cultivation and reclamation.

North-Western Provinces and Oudh.—The alterations made during the year in the areas under forest management were not important. In all, 83 square miles were gazetted as Reserves under the Forest Act, but this was more than balanced, at least on paper, by the reduction, on re-computation of areas by the Forest Survey Branch, of 88 square miles in the Reserved tracts. The alteration took place principally in the Central Circle. An area of one

square mile was added to the Protected Forests, and 3 square miles were excluded. The area of the Unclassed State Forests remained unaltered during the year.

Punjab.—The additions to the area of Reserves consisted of 146 square miles in the Kala-Chitta Hills of the Ráwalpindi District, comprising forest hitherto protected, and 13 square miles taken up on the Sohág and Pára Canal, in the Montgomery District, in view of the possible extension of irrigated plantations.

Central Provinces.—The area under the control of the Forest Department remained practically the same throughout the year, the only alterations being a *net* decrease in the Reserves of 4 square miles, due to disafforestation, and of 7 square miles in the Unclassed Forests, due to a re-computation of areas. The area of the "A Class" of Reserves was more than doubled during the year, having increased from 4,010 square miles at its commencement to 8,163 square miles at its close.

Burma (Lower).—The recorded area of the Reserved Forests was increased from 5,111 to 5,574 square miles. The additional area comprised 18 square miles reserved in the Tenasserim Circle and 431 square miles in the Pegu Circle, the balance of 14 square miles being due to a rectification of areas consequent on more accurate surveys.

Burma (Upper).—At the close of the year, an estimated area of 8,895 square miles, exclusive of the 35 square miles of Unclassed Forests in the Ruby Mines District, had been explored. The estimates of area of the various tracts were of necessity extremely rough in some cases, and they will be liable to considerable modification as more detailed information is gained respecting them.

Assam.—The area under forest control underwent but slight alteration during the year. The Reserved area received an addition of 25 square miles, and the Protected Forests were reduced by 5 square miles given away for cultivation, while 28 square miles of Unclassed Forests were excluded for the same purpose, and 9 square miles, previously allotted, were resumed. Of the 61 square miles under settlement at the close of the previous year, 25 were notified as Reserves.

Coorg.—No alterations were made in the area of the Reserves. An aggregate area of some 3 square miles is shown as having been excluded from the Protected Forests, but this is due to corrections on account of sales and encroachments extending over several years. The total area under forest management at the close of the year was recorded as 241 square miles of Reserved and 615 square miles of Protected Forests.

Ajmere.—No additions were made to the Reserves during the year, but the area under forest control was increased by the addition of certain village lands which their owners were induced, in their own interests, to make over to the Forest Department for management. Six such areas, containing in all 4,395 acres, were brought under this system of control during the year, so that the total area of these "*Village Reserves*" amounted at the close of the year to 5,235 acres, or 8 square miles. The progress made in this direction, which is the chief feature in the record of the year's work, was very satisfactory. It is a matter for regret, however, that it is not yet feasible to place these village areas under the protection of the special Forest Law by declaring them State Forests. The question of bringing the Village Reserves under special legislation, which will facilitate their management, was under the consideration of the Government of India at the close of the year.

Andamans.—The estimated area of forest was, for the first time, given, and is entered as 1,959 square miles, or 30 square miles less than the entire area of the main islands. Only a portion of this area, however, is clothed with deciduous forest, in which alone the valuable 'Padauk' (*Pterocarpus indicus*) is found, and in which nearly all clearances for cultivation and for the extension of the settlement take place.

Baluchistan.—The additions to the area under forest management, which it was anticipated would be made during the year under review, were not effected.

Berar.—The area of Demarcated State Forests remained unchanged. District Reserved Forests were increased by 534 square miles transferred from Unreserved Forests, and the latter class gained, by re-computation of areas and by a balance of 6 square miles abandoned in excess of that taken up for cultivation, 163 square miles, as a set off against the 534 square miles lost by transfer.

Madras.—The forest area at the disposal of Government amounted at the end of the year under review to 17,543 square miles. Out of this, 3,738 square miles had been notified as Forest Reserves; in 6,400 square miles the settlement of the property and of adverse rights had been completed, although notifications had not as yet been issued: the settlement was pending in regard to 3,012 square miles. During the year under review 307 square miles were added to the area of the Reserves.

Bombay.—The area of Reserved Forests has been increased, according to the statements accompanying the Conservator's report, by 101 square miles; but much of the apparent enhancement was due to the correction of book-entries in the Northern Circle.

II.—Forest Settlements.

5. A satisfactory feature in the progress of Forest Administration is the constantly spreading recognition of the fact, that finality as regards the possession of forest property and the settlement of adverse rights is the necessary basis of sound forest management by the State; and that this finality can only be secured by the creation of Forest Reserves.

Considerable progress has been made in this respect during the year under review, both in regard to the settlement of new areas and the conversion of Protected Forests into Reserves.

In the Madras Presidency, Forest Settlements are considered in the light of purely judicial proceedings, and the Forest Settlement Officers and Appellate Courts decide on the facts and proofs as they are brought before them. This procedure is unquestionably the intention and correct interpretation of the forest law, and doubtless yields the most stable and satisfactory results.

In almost all other Provinces in which Forest Settlements are still in progress, the proceedings are, to a greater or lesser degree, leavened with administrative interference. This is defensible, and to some extent practical, in undeveloped forest countries, such as are found in the hilly parts of Burma, of Upper Assam, and in parts of Bengal, where Forest Settlements mean frequently nothing but the selection of the most suitable tracts for permanent forest reservation; but in cases where the State forest property is barely sufficient for the present and future requirements of the country, the strict legal settlement of the property and the adverse rights with which it may be burdened, is the only possible safeguard against future difficulties for which, should such arise, the present administration must be held responsible.

The facts are not rarely lost sight of that the subsequent forest management is, on the one hand, frequently paralysed by the recognition of unproved privileges, and that, on the other, a strictly legal settlement does not preclude the forests being worked for the benefit of communities or persons unable to establish a right, but whom, for reasons of general administration, it is desirable to favour. There are numerous historical precedents regarding the danger of the forest capital, necessary for the future requirements and the development of a country, being sacrificed and consumed in order to make things smooth for the time being.

In some Provinces, notably the Punjab, there has been an unexplained delay in notifying the results of Forest Settlements, which were practically completed several years ago. Such a policy of delay and abstention renders the management of the forests extremely difficult, and may lead to misunderstandings on the part of the right-holders with respect to future claims. In view of this necessity, the settlement should not be delayed or complicated by administrative interference, which is strictly no part of the Settlement Officer's duty.

6. *Bengal.*—The final settlement of forest areas, declared to be Forest Reserves under section 34 of the Forest Act, is in progress. In connection with this, the Local Government regazetted areas under section 4 of Act VII of 1878, which had already been created Reserved Forests under section 34, subject to a future settlement of adverse private rights exercised within their boundaries; after consulting, however, their legal advisers, the Government of India declared such procedure to be unnecessary and not demanded by the provisions of the Forest Law.

No new areas were gazetted during the year either under section 4 or 19 of the Forest Act.

North-Western Provinces and Oudh.—Notifications were issued proposing the reservation in the Central Circle of 141 square miles in the aggregate, and the Forest Settlement of these areas was reported as being in progress. Proposals for improving the boundaries of certain forests in the Oudh Circle, by means of exchanges with private owners, were also under consideration.

Punjab.—The question of further reservation of forests, with a view to the possible extension of irrigated plantations, was under consideration, as were the Forest Settlements of the Kangra District, which also include those of Kulu and Shahpur-Kandi. The delay in the issue of final orders regarding these latter settlements was commented upon by the Government of India, who again expressed a hope that these forests might be placed on a sound and legal footing under the Forest Act. Principles have also been laid down which will in future regulate the administration of the Reserves and Government waste in certain important *bár* lands, and this subject was under consideration during the year.

Preliminary notifications were issued, under section 4 of the Forest Act, with a view to the reservation of 11,000 acres, chiefly in the Gujrát and Gujránwála Districts. Proposals were also made to demarcate as Reserves some additional 141 square miles of the leased forests of the Bashahr State.

The Khwárra and Zira Forests of the Kohát District were declared Protected, and suitable Rules framed for their management under Chapter IV of the Forest Act. These forests, however, have not been placed under the control of the Forest Department.

Central Provinces.—The settlement of State Forest property in the Central Provinces has been completed, and the question which remains is to gradually select areas for a more extensive forest treatment. Very material and satisfactory progress was made in this direction by transferring forest areas from "Class B", which are not regularly treated and from which grants are liable to be made for the extension of cultivation, to "Class A" which are strictly conserved.

Burma.—In Lower Burma the subject of the Cutch supply of the future received attention, and the Government of India considered that the results of the experiment of setting apart village Cutch forests would have an important bearing on this serious question. The settlement of some proposed Cutch Reserves in the Sinbaungwé township, Thayetmyo District, approached completion, and further proposals for the reservation of Teak and Padouk-producing tracts, as well as of certain fuel and fodder reserves, were dealt with during the year under review.

Upper Burma.—The exploration of the forests was greatly facilitated by the more settled state of the country during the year, and much useful knowledge was acquired of forests which were till then unexplored. The Government of India considered that it should be possible, now that the Staff of the Department is at nearly full strength, to spare one or more officers for the exploration of the forests on the drainage system of the Salween river.

Although the paucity of Civil Officers precluded the completion of any Forest Settlements during the year under review, several areas were selected for reservation, so that up to the close of the year the area preliminarily notified exceeded 2,000 square miles. Proposals for further reservations, comprising 514 square miles, were also under consideration, and a special Forest Settlement Officer was appointed. The formation of Cutch Reserves in the Pyinmana District also met with attention.

Assam.—Of the 61 square miles under Forest Settlement at the close of the past year, 25 square miles were notified as Reserves; the balance, 36 square miles, together with 101 square miles, which would appear to have been notified during the year as proposed Reserves, remained under settlement at the end of the year.

Coorg.—Although final orders were not passed during the year in regard to the areas under settlement, considerable progress was made in dealing with appeals against the Settlement Officer's orders. It would appear that, in addition to 188 square miles of Reserves the grazing rights within which were under settlement at the commencement of the year, the settlement was taken in hand of 87 square miles of previously constituted Reserves, and 6 square miles of Protected Forests which it is proposed to reserve.

Ajmere.—As stated above, certain village land, aggregating 4,395 acres, were brought under the control of the Department during the year. These were not, however, declared State Forests. It does not appear that any Forest Settlements were in progress or contemplated during the year.

Andamans.—The question of systematizing the methods by which the progress of clearances in deciduous forest containing 'Padauk' is regulated was under consideration. The desirability of making suitable provision near at hand to meet the requirements of villagers in forest produce, as well as of arranging a definite forest policy by which the more valuable

and compact padauk-producing areas will be maintained permanently under forest in view of meeting the increasing demand for that wood, was specially brought to the notice of the Local Government. The Government of India expressed their opinion that the introduction of the Forest Act and the creation of Reserved Forests are not necessary to the attainment of the objects in view.

Baluchistan.—No settlements were made, and the additions to the area under forest management, which it was anticipated could be carried into effect during the year under review, were not effected.

Berar.—No Forest Settlements were in progress during the year.

Madras.—Forest Settlements in respect of a gross area of 3,012 square miles were pending at the close of the year under review. The area finally notified was again small. A very large area, amounting to 6,400 square miles, has been actually settled, but final notifications were delayed owing to various causes. The Madras Forest Settlements are the most perfect of any in India.

Bombay.—The true increase consequent on Forest Settlements amounted only to 62 square miles. The settlement of forest rights made even less progress than in the previous year, when it was admitted to be unsatisfactory. Information was furnished regarding the cost of these Settlements per square mile of forest. The policy of the Bombay Government of converting their Protected Forest areas into Reserves has been approved of by the Government of India.

III.—Demarcation.

7. The importance of a secure and permanent demarcation of the State Forest property is now being recognised by every Government, and the progress in this direction has been very marked of late years, so that the majority of our Reserves at least are permanently defined by substantial boundary marks. In this connection, the fact must not be lost sight of that, but a few decades back, the demarcation of jungles and waste was considered to be almost superfluous.

8. *Bengal.*—Satisfactory progress was made in this work, a total of 2,087 miles of boundaries having been demarcated or cleared during the year. The cost of new demarcation was R7-3 per mile as against R16 in the preceding year. Charges on account of maintenance were also reduced from R6-2 to R5 per mile. The total expenditure debited to "Demarcation" was R5,465

North-Western Provinces and Oudh.—The attention paid to the maintenance of the forest boundaries, on which a sum of R6,106 was expended during the year, appears to have been sufficient in all Circles; but the information on the subject is difficult to summarize for the three Circles. The Nepal authorities again neglected to clear the neutral strip on their side of the boundary of the Government forests.

Punjab.—Boundary lines aggregating 350 miles were marked off during the year, while repairs extended over 381 miles. Some nine thousand pillars were either newly built or repaired, and it was stated that the demarcation of such Unclassed Forests as it is proposed to constitute Reserves, had Received attention during the year.

Central Provinces.—The condition of the forest boundaries and the nature and cost of the demarcation work carried out during the year were very fully reported on by the Conservator. The total length, so far as it is possible to estimate this at present, of the artificial boundaries of the forests in the Central Provinces, amounted at the close of the year to 14,408 miles, and of these, all but 934 miles are stated to have been cleared during the year. In addition, 12,204 new boundary marks were built, and 34,856, out of a total of 84,213 previously existing marks, were repaired. The amount spent on these works amounted, however, only to R7,991 in all, of which R4,187 were spent on new works.

Burma.—In *Lower Burma* it was reported that, with one or two exceptions, the boundaries of all sanctioned Reserves had, at the close of the year, been demarcated, and that the repair and renewal of boundary marks were attended to in both Circles.

In *Upper Burma* no boundary work was undertaken, there being as yet no Reserved Forests.

Assam.—No new demarcation work appears to have been undertaken, but existing boundary lines and marks were kept in repair, and nearly all were inspected during the year.

Coorg.—As a consequence of the directions given, alluded to in the Review for 1888-89, further information was furnished on this subject, from which it would appear that the total length of the artificial boundaries of the Reserves is 296 miles, and that these are marked by

925 mounds and by 1,986 survey stations. The artificial boundaries of the Protected Forests are reported to measure 215 miles, and are marked by 3,650 mounds and 104 survey stations. During the year all the boundaries of the Reserves and 25 miles of those of the Protected Forests were cleared. But most of the boundary marks remain in a state of disrepair, while a large area exists which has not been demarcated at all. It would appear that the whole question has not received sufficient attention; and suggestions were made after the close of the year with a view to an immediate improvement in this respect.

Ajmere.—A small amount of new boundary work was carried out, and all existing pillars were kept in a state of repair.

Andamans.—There are no Reserved or Protected Forests in the island, and no forest boundaries.

Baluchistan.—Some of the areas set aside for forest management remained undemarcated at the close of the year, and the question appears not to have received sufficient attention The Government of India declared their opinion that all such areas should have their boundaries clearly defined on the ground.

Berar.—Special information on the subject of demarcation was called for by the Government of India during the year, and this shows that the boundaries of the different classes of forests have been properly marked off and are maintained in good order.

Madras.—The progress made in the demarcation of the forests, so far as can be gathered from the Report, appears to have been satisfactory. It is understood that more precise information will be furnished under this head in Reports of future years.

Bombay.—Boundary work progressed in all the divisions of the Northern Circle at a total cost of R10,594. twenty-eight thousand three hundred and ninty eight cairns were erected on 2,269 miles of boundaries The information regarding the work done in the Southern Circle is somewhat vague. Sixty-four miles of boundary line were cleared in Kanara, and R4,798 was spent on demarcation in Ratnagiri in connection with settlement. In the Sind Circle, satisfactory progress was made in the erection of special boundary marks.

IV.—Surveys.

9. Soon after the establishment of the Forest Department in India, the want of reliable maps on a sufficiently large scale made itself felt. They were required not merely as a guide to Forest Officers, but even more in order to systematize the work of management and exploitation, and for the purpose of estimating the value and productive power of the State forest property.

The Survey of India Department had at that period more work of other kinds than it could accomplish, and no material progress was made as regards forest-surveys, the demand for which became more and more urgent. This led to the establishment, in 1872, of the special Forest Survey Branch under a separate Superintendent. It was at the time contemplated to expand this Branch with the increasing demands on it. The requirements of the Department for reliable maps rose indeed rapidly, due to the development of Working-Plans Branches in every Province; but in view of the large Survey establishments already in the service of the State, for a considerable portion of which employment would, within a few years, have to be found, it was determined not to make any material expansion of the Forest Survey Branch, but to leave the larger forest-surveys to be executed by parties of the Surveyor General's Department, as their services might become available from other work. When this principle was once recognized, the absorption of the Forest Survey Branch into the Survey of India Department became, with special reference to the recruitment of its superior Staff, a necessary consequence. The transfer was practically decided upon in the year under review, though it actually took place only in October 1890.

The Forest Survey Branch has, during the years of its separate existence, done much towards cheapening the cost of forest-surveys, mainly by the substitution of indigenous agency for all work which could be done as well by Natives as by more highly paid Europeans, and by lowering the proportion of

the cost of control to that of execution. It should, however, be explained that the control of the detailed forest-surveys, conducted by the officers thus transferred, still, by agreement with the Surveyor General, remains with the Inspector General of Forests.

The cost rates, per square mile, of the surveys during the year under review were as follow :—

Presidency or Province.	Locality.	Scale.	Cost rate per square mile.	Agency.
			R	
MADRAS . .	Salem, Madura, and Tinnevelly Districts, in the Southern Forest Circle	4″=1 mile	148	Survey of India Department.
BOMBAY . .	Poona, Thana, Nasik and Satara Districts, in the Northern Forest Circle, and North Kanara and Dharwar Districts, in the Southern Forest Circle	4″=1 mile 8″=1 mile 16″=1 mile	84 110 185	Survey of India Department.
NORTH-WESTERN PROVINCES.	Jhansi District, in the Central Forest Circle.	8″=1 mile	39	Survey of India Department.
	Jaunsar Forest Division, in the School Circle.	4″=1 mile	30	Forest Survey Branch.
PUNJAB . . .	Bashahr State, Himalayas . .	1″=1 mile 4″=1 mile	14 65	Forest Survey Branch.
CENTRAL PROVINCES	Hoshangabad and Betul Districts, in the Northern Forest Circle.	4″=1 mile	134	Survey of India Department.
	Bhandara, Chanda and Raipur Districts, in the Southern Forest Circle; and Jubbulpore District in the Northern Forest Circle.	4″=1 mile 16″=1 mile	50	Forest Survey Branch.
BURMA (LOWER) .	Prome, Thayetmyo and Toungoo Districts, in the Pegu Forest Circle.	4″=1 mile	354	Survey of India Department.

10. *Bengal.*—A party of the Survey of India was employed during the year on the survey of the Jalpaiguri forests, and the mapping of the Singbhum forests by the Imperial Forest Survey Branch was in progress. Certain petty surveys were executed by the Forest Department costing 2 or 3 rupees only.

North-Western Provinces and Oudh.—Surveys made considerable progress during the year in all three Circles. In the Central Circle, in addition to departmental surveys by local officers, a Survey of India party was employed during the year. In the Oudh Circle, some small departmental surveys were made in connection with the proposed exchanges of land for the purposes of consolidating the forest boundaries. In the Central Circle, a small area of 2½ square miles in the Ninglat-Gogar forests, as well as certain other forest boundaries, were surveyed by the Forest Survey Branch at a cost of R817. In the School Circle, surveys were in progress in the leased forest of Tehri-Garhwal and those of Karamba and Korwar in Jaunsar, all of which were completed. Thirty-nine square miles were surveyed on the 4-inch scale, of which 4 square miles were afterwards mapped on the 16-inch scale. The total cost was R1,167.

Punjab.—Surveys were continued by a party of the Revenue Survey Department in the Kangra District, and the Forest Survey Branch extended its work in the leased forests of the Bashahr State. In the latter locality, triangulation was extended in the Pandrabis Pergunnah and in the Kailás range, 378 square miles were completed as against 889 square miles in 1888-89. As regards topographical work, 500 square miles were completed as against 215 square miles finished in the previous season. One hundred and ninety-eight and 302 square miles were mapped on the 4-inch and 1-inch scales respectively, the cost-rates corresponding being R65-8 and R14-6 per square mile. The total expenditure incurred was R17,461.

Central Provinces.—Survey parties attached to the Survey of India and to the Forest Survey Branch were employed during the year, and completed the topographical survey of 817 square miles on the scale of 4 inches to 1 mile, and 69 square miles on the 16-inch scale. Skeleton traces showing, in the manner previously suggested, the nature of the soil and the forest-growth were also prepared for the 404½ square miles mapped by the Survey of India party. The Forest Survey Branch was employed in the Jubbulpore, Raipur, Chanda and Bhandara Districts. Topographical surveys extended to 488 square miles, of which 418 were mapped on the 4-inch and 70 on the 16-inch scales. The survey of the Ahiri forests was completed. Rupees 24,367 in all were expended. The average cost-rate per square mile was R50.

It is understood that this is the first occasion on which forest stock-maps, similar to those in use in continental countries, have been prepared in India.

Burma.—The outturn of work of the Imperial Survey Department in Lower Burma was less than that of previous years, which has always been regarded as small and proportionately costly. One hundred and seventy-one square miles of detailed surveys on the 4-inch scale were executed, and 240 square miles are reported to have been traversed over. The expenditure of R1,08,900 incurred on this work was high as compared with the result achieved. It was reported that the party was late in taking the field, owing to illness, and afterwards suffered from sickness in the specially malarious forests of the Toungoo District during an exceptionally unhealthy season. These causes may be accepted as in some measure explanatory of the little progress made at an excessive cost. They, however, indicate the desirability of making these surveys as far as possible by the agency of surveyors and men recruited and taught in Burma, who are less liable to be prostrated by the climate, and are more easily supplied with food. Experience has now shown that Burmans can be successfully trained as surveyors.

In Upper Burma a considerable number of surveys, for the most part traverses with chain and plane-table by officers of the Department, were carried out, and the amount of work done in this direction compares favourably with that carried out in the previous year. The total length traversed amounted to 2,009 miles.

Assam.—The survey of the important sál forests in the Goalpára District was commenced during the year under review by a party of the Forest Survey Branch, assisted by an officer of the Department. Elsewhere practically no survey work was attempted. In Goalpára the preliminary work of triangulation and traversing was done. The former was extended over an area of 94 square miles and the latter covered 437 square miles. The work done was not computed up to the close of the year owing to the non-connection of the work with the data of the Great Trigonometrical Survey. The total cost was R21,616.

Coorg.—No survey work was undertaken during the year.

Of the total area of 856 square miles under forest management, it is reported that 44 square miles of Reserved and 309 square miles of Protected Forests remain unsurveyed, and the Government of India expressed an opinion, at the close of the year, that the subject of completing the surveys of Reserves and the mapping of the Cardamom estates in the Ghât Forests should receive consideration in connection with the question of the more complete demarcation of the forests, the faulty state of which has been commented upon in the previous section of this review.

Ajmere.—The only work done appears to have been the checking of the boundaries of some of the Forest Reserves.

Baluchistan.—A small amount of work, consisting of the survey and mapping of a portion of the Shebo plantation, was carried out.

Andamans.—Nothing in the direction of survey work was done during the year.

Berar.—An area of 8 square miles, inadvertently omitted during the previous year, was surveyed by the Forest Survey Branch, which was also engaged on the preparation, printing and publishing of certain maps, and this work was almost completed. The expenditure incurred by the Branch amounted to R4,746. No surveys are reported to have been made by local Forest Officers.

Madras.—The chief work carried out was that of the Government of India Survey Party in the districts of Salem, Madura and Tinnevelly in the Southern Circle, where 1,182 square miles of triangulation, 211 square miles of topography, and 628 linear miles of traversing were completed. The amount of work done was unsatisfactory, while the cost per square mile was R148 instead of, as anticipated, R70. The cost per square mile for similar work performed by the Imperial Forest Survey Branch in the Bengal Presidency averages about R80. The Government of India, in reviewing the work done, regretted the unsatisfactory progress of the survey and its high cost. The Madras Survey Department was also employed on the survey of the Kodaikanal Settlement on the Palni Hills, and various departmental surveys were carried out. Departmental surveys have, however, been stopped by order of the Madras Government.

Bombay.—In the Southern Circle, topographical surveys on the 4-inch and 8-inch scales were continued, and 419·75 square miles were completed at a cost of R34,054. The cost per square mile amounted to R81·2, which compares favourably with previous work. It is uncertain, however, from the Conservator's Report, what localities were under survey. In the Northern Circle a party of the Topographical Survey was employed in the districts of North and South Thana, Nasik, Poona and Satara. A certain amount of traverse and triangulation surveys were carried out, while 175 square miles of detailed work on the 4-inch, 8-inch and 16-inch scales was completed. In the Sind Circle, surveys of four forests in the Sukkur Division, aggregating 17·2 square miles, were completed.

V.—Working-Plans.

11. It is unsatisfactory to have again to record the slow progress made in the preparation of these plans, the amount of work done comparing unfavourably even with that for the previous year. Of the six Provinces under the Government of India in which special arrangements have been sanctioned for the conduct of this work, in three, *viz.*, Bengal, the Central Provinces and the Punjab, operations were practically in abeyance for the greater portion of the year. The scanty progress made must be assigned, in the first instance, to the inadequacy of officers of the controlling staff who are specially fitted for such work which, hitherto, has been often unnecessarily elaborate. It should be mentioned that the three provinces indicated above, where the preparation of working-plans is so backward, are, from the nature of the local circumstances or conditions bearing on this question, perhaps those where systematic forest-working is most urgently called for. In Assam, the North-Western Provinces and Oudh, and in Burma, the operations conducted under this head during the year were limited. It seems clear, in view of the ever-increasing desirability for the speedy preparation of working-plans for those forests which have been, or will probably in the near future be, regularly exploited, that the necessary examinations of the forests and the collection of information must be, in great part, undertaken as part of the ordinary duties of Divisional Forest Officers. In the great majority of cases in India working schemes of the simplest nature are all that is necessary in order that the forests may be permanently exploited with order and reasoned method. In such instances the laborious collection of statistics and the application of elaborated methods of treatment are not required, and would often defeat their aim or hinder the work-man-like conduct of forest exploitation. The preparation of such simple working-plans is, therefore, within the time and competence of the average Forest Officer, if the work be conducted systematically.

The working-plans submitted during the year from Provinces under the Government of India for the scrutiny of the Inspector General of Forests, and those finally sanctioned by Local Governments, were as follow: —

Province	Plans submitted for opinion and remarks of Inspector General of Forests.		Plans finally sanctioned by Local Governments on recommendations of Inspector General of Forests	
	Number	Area for which prepared.	Number	Area for which prepared
Bengal	1	28 square miles.		
North-Western Provinces and Oudh	2	297 "	1	26 square miles.
Punjab	1	6 "		
Burma	...	.....	1	138 "
Assam	...	.....	1	7 "
Total .	4	331 square miles.	3	171 square miles.

The annexed statement shows the areas in the various Provinces managed in accordance with working-plans which have been sanctioned by Local

Governments, after being submitted for the scrutiny and opinion of the Inspector General of Forests :—

Areas brought under the control of sanctioned Working-Plans up to end of 1889-90, in Provinces under the Government of India.

Province.	Forest Area, in square miles.				Area for which Working-Plans prepared up to 31st March 1890.	Proportion of forest area under Working-Plans.
	Reserved.	Protected.	Unclassed State.	Total.		
					Sq. Miles.	Per cent.
Bengal	5,195	2,239	4,033	11,467	2	0·02
North-Western Provinces and Oudh	3,591	67	132	3,790	777	20·50
Punjab	1,694	358	3,920	5,972	152	2·54
Central Provinces . . .	19,708	...	318	20,026	*Nil*	*Nil*
Burma (Lower) . . .	5,574	...	...	5,574	1,072	19·23
Burma (Upper) . . .	...	8,895	35	8,930	*Nil*	*Nil*
Assam	3,472	932	5,597	10,001	7	0·06
Coorg	241	615	...	856	83	9·69
Ajmere	139	...	8	147	*Nil*	*Nil*
Baluchistan	...	...	39	39	*Nil*	*Nil*
Andamans	...	...	1,959	1,959	*Nil*	*Nil*
Berar	2,072	...	2,244	4,316	*Nil*	*Nil*
Total .	41,686	13,106	18,285	73,077	2,093	2·86

From the tables printed at paragraph 31 of the Review for 1888-89 it will be seen that, at the close of that year, the proportion of the forest area under working-plans amounted to 2·76 per cent. of the total area under Forest controlled by the Department. The proportion controlled by these plans has, therefore, only been increased by 0·10 per cent. during the year under review.

As mentioned in the last Review, the Government of India prescribed in Circular No. 9 F. of 14th May 1889 that, in order to ensure the necessary uniformity in the preparation of these plans, and to obviate their undue elaboration, preliminary proposals regarding the scope of each proposed plan should be submitted to the Inspector General of Forests for his opinion. In accordance with the instructions therein contained, preliminary proposals as regards two plans were submitted from Assam and Burma. But in other cases the procedure prescribed was not observed.

12. *Bengal.*—The progress made was again limited, owing to the division specially designed for the execution of this work remaining in abeyance for the greater part of the year. The working-plan for the Darjeeling forests, which has been under preparation or revision for several years, was not completed during the year. The Sukna working-plan also, it appears, required revision, while that in force for the Bamonpokri forest appears ill-adjusted to meet the requirements of the market. In this connection the Government of India, reviewing the progress made during the year, expressed their approbation of the proposed development of this branch of forestry, which has hitherto been too generally neglected in Bengal.

North-Western Provinces and Oudh.—Although considerable progress has been made in the preparation of working-plans for the forests of the North-Western Provinces and Oudh yet, as was noted in the Review for 1888-89, much remains to be done in this direction, and it is, therefore, satisfactory to observe that this work will be pushed forward. The results of past operations tend to show, in the opinion of the Local Government, that a more systematic working of the forests, in accordance with the provisions of such plans, would have the effect of improving both the forests and the revenue, and these views have been endorsed by the Government of India. In the Central Circle there are eight plans in force, the only plan under

preparation during the year being that for the Kothri forest which, although completed, was not submitted for sanction. In the Oudh Circle, owing to there being no special officer available, the Kheri and Gorakhpur plans, which had been long under preparation, were not completed. In the School Circle no new plans were in course of preparation, but that for the Jaunsar Chír forests was sanctioned during the year. In the Central and School Circles there were considerable deviations from the sanctioned plans, due to short demand or to excess of material available, and for other reasons.

Punjab.—It is again unsatisfactory to have to record the small progress made during the year in this Province. The special Branch remained in abeyance until nearly the close of the year. The proposals dealing with the Pangi forests, as well as with those of Murree and Kahuta, which were framed some years back, had still, at the close of the year, to be submitted for orders; and there would seem to have been uncalled-for delay in forwarding these plans for final disposal. In reviewing the progress made during the year, the Government of India noticed with satisfaction the intention to prepare plans for the forests of the Bashahr State, and urged that they should also be undertaken for the Kulu forests.

Central Provinces.—A commencement was made in the Northern Circle in the preparation of working-plans, but it was found necessary, after the close of the year, to transfer to another Province the special officer employed on this work. As has already been pointed out in the Review for 1888-89, it is only by utilizing the Divisional Staff that, in view of the immense area for which plans are required, any material progress can be looked for. The small quantity of work done in this Province, where plans are so urgently required, is matter for regret.

Burma.—In Lower Burma progress in the preparation of working-plans was limited to the Pegu Circle, where a plan for the Bawbin-Minbu forests was framed, and the field work for a plan of the Taungnyo forests completed. Further progress was prevented by the illness of both the officers engaged in the work. In Upper Burma it was reported by the Conservator that in most forests the working had been excessive, and this would point to the urgent need for such working-plans as can, under existing circumstances, be prepared. Special reports on the Western Pyinmána forests, and on those of Theingôn were prepared. And it was decided, on the data therein furnished regarding linear valuation surveys of teak, that this species should be no further girdled in these areas. Linear valuation surveys were carried out over 6,639 acres in eight divisions, in only three of which, however, was the work done on a large scale. As these surveys have already led to most important results in the determination as to whether girdling should take place or not over particular areas, it is most desirable to continue them and to extend them to all forests.

Assam.—The special working-plans staff was employed in connection with the survey of the valuable sâl-bearing tracts in the Goalpára District, in marking off the different classes of forest growth in accordance with the recommendations contained in the Inspection Report of the Inspector General of Forests, as well as in enumerating trees in sample areas. These operations were carried out with a view to the preparation of working-plans for the *sâl* forests, and the progress made seems to have been satisfactory.

Coorg.—Although, as noted in the Review for the past year, the Supreme Government had suggested that working-plans for the Coorg forests should be prepared without delay, no plans were framed during the year under review. Steps are, however, now being taken to prepare such plans, and the matter is receiving the Deputy Conservator's attention.

The preparation of rough working-plans based on area was suggested in the Inspection Note prepared in 1890 by the Inspector General for these forests.

Ajmere.—The advisability of having working-plans prepared for the Ajmere forests was urged by the Government of India when reviewing the Report for the preceding year; and, although it does not appear that any plans were under preparation, it is satisfactory to observe that the subject is receiving attention.

Baluchistan.—No plans were prepared during the year; and it is unadvisable to undertake work in this direction until it has been decided what policy in regard to forest protection and improvement is to be pursued in the future. The assembling of the Conference which was to have disposed of this question during the year, has been postponed until the winter of 1891-92.

Andamans.—It was stated in the Forest Report for the year that, as the Department at present extracts timber from areas about to be cleared for cultivation and settlement, attention to sylvicultural rules is not required, and that hence no working-plans are necessary pending the constitution and working of Reserved Forests. Working-plans will, however, become a necessity, under any circumstances, as soon as a large demand arises. And in view of the systematic utilization of the forest resources of the island, a further and more complete examination of the padouk-producing forests is desirable.

Berar.—Although no working-plans were prepared during the year under review, steps were taken which, it was anticipated, would lead to the Melghat Reserves being brought under the provisions of a working-plan during 1890-91. The collection of the necessary data with a view to the elaboration of more simple plans for the South Berar Reserves received attention, and the systematic management of these forests was also to be arranged for within the next year.

Madras.—The progress made in the preparation of working-plans was small; and the Government of India, in reviewing the work for the year, endorsed the view that plans to the necessary number could not be prepared without a considerable increase in the forest staff. Plans for twelve Reserved Forests were almost completed during the year, and the collection of statistics in view of further plans was proceeded with.

Bombay.—In the Northern Circle, considerable progress has been made in the preparation of working-plans, which have, apparently without exception, been based on area, without regard to the yield of material. It is no doubt desirable to bring the whole forest area as soon as possible under working-plans, and therefore this somewhat undeveloped method is not so open to immediate objection as it otherwise would be. But though area is obviously the safest basis upon which to organize forest working, it is desirable to supplement the mere sub-division of the area by previsions regarding the possible yield. These views were brought to the notice of the Bombay Government at the close of the year under review.

The Conservator of the Northern Circle reported on and justified the necessity for small-sized working-circles, though the forest management is thus rendered more expensive than would otherwise be the case.

The progress made in the preparation of working-plans in the Southern Circle was unsatisfactory, and in Sind no attempt was apparently made to bring into operation pre-considered plans of working, though, as explained by the Conservator, the sylvicultural treatment of the forests is of the simplest kind.

VI.—Communications and Buildings.

13. The amount spent under this head aggregated, during the year, R2,83,829, or 1·85 per cent. of the gross revenue, and of this only 0·77 per cent. were spent on account of roads. There is no denying the fact that the means of access to the forest resources of the Empire are as yet in a very undeveloped state, and that it is false economy to be saving in opening out the forests, to a wider market, when once the rights which may burden them have been finally settled. Uncertainty in this regard is no doubt a most efficient hindrance to all development of forest management; but satisfactory settlements are now sufficiently advanced in many parts of the country to make an investment in more and in better roads secure and advisable.

In the Prussian monarchy, where the road system is on the whole very complete, some 3 per cent. of the gross forest revenue is set apart for buildings and on repairs of forest export-roads, and about 4 per cent. for other buildings.

The amount expended on forest roads is distributed over the several Provinces as follows :—

	R
Bengal	7,648
North-Western Provinces and Oudh	56,153
Punjab	6,293
Central Provinces	2,036
Burma	875
Assam	4,163
Coorg	1,015
Berar	11,337
Madras	27,591
Bombay	1,597

14. *Bengal.*—Eleven miles of export-roads and 50 miles of inspection paths were opened out during the year, while repairs to existing roads and paths were attended to. New buildings cost R7,500, and R6,448 were expended on repairs. The total charges of the year on account of Roads and Bridges amounted to R7,648.

North-Western Provinces and Oudh.—Satisfactory progress was made in developing the forest resources of the Province by the construction of export-roads and buildings. The expenditure was R98,091, as compared with R1,02,586, expended during the preceding year. Of this sum, R56,153 was for the construction of roads and bridges, and, in addition to maintaining existing roads and bridges, covered the cost of constructing 183 miles of new roads, including 30 miles of cart-road in the Central Circle, at a cost of R6,974, and the Thadisr sledge-road, 1½ miles long, in the School Circle, built at a cost of R4,843 to replace the sleeper slide destroyed by floods in the previous year. Rupees 39,390 were spent on buildings, of which 33 were new.

Punjab.—In this Province the works undertaken were not of an important nature. Rupees 6,293 was expended on communications, of which R3,582 was incurred on new construction. The expenditure on buildings amounted to R5,522, of which R2,056 was for new work, and the balance for maintenance.

Central Provinces.—The sum spent on road-improvements during the year amounted to R2,036 only, and on buildings to R4,131. The Government of India, in reviewing the year's work, stated that this outlay, although in excess of the expenditure incurred on similar works in the previous year, does not, *primâ facie*, seem to be proportionate to the probable requirements of the vast area administered by the Forest Department in the Central Provinces; and as this is also the view of the Local Government, it is to be hoped that these important considerations will receive more attention than heretofore.

Burma.—In Lower Burma the total expenditure under this head amounted to R14,562 as follows: communications R632; buildings, R10,190; and other works, R3,740. It is noticeable that the expenditure on roads and bridges appears inadequate.

In Upper Burma the building of offices and of dwelling-houses for officers and subordinates continued to receive attention. A sum of R16,181 was expended on new buildings, while repairs cost R1,170. The expenditure on roads was insignificant.

Assam.—The only new road prepared was one 3½ miles long, made at a cost of R411. Rupees 3,752 represent the cost of the repairs of existing forest roads and paths. Rupees 15,945 were expended on building work, chiefly repairs.

Coorg.—It was reported that no new roads or buildings were constructed during the year. A sum of R1,015 was spent on the repairs of roads and R827 on buildings. The proposal for a tram-line from Hunsur to the Nalkeri forests was reported on by the Officiating Inspector General after his tour of inspection in these forests in 1888-89, and the subject received consideration.

Ajmere.—No expenditure was incurred on communications during the year: R94 was spent on buildings.

Baluchistan.—Quarters for forest guards at Zangi Lora and at Dhobi Ghât at a total cost of R72, and repairs to buildings were effected where necessary.

Andamans.—No roads were constructed during the year, but the laying of a tramway, 1½ miles in length, was sanctioned in order to facilitate the extraction of timber and other produce from the forests, and it will be interesting to note the results derived in the future from this experiment.

Berar.—In the Melghât, 24 miles of roads were completed by the Department, and also a road, 12 miles in length, from Chowrakhund to Buttram. The cost incurred was R10,801, or R450 per mile. Repairs were executed over 160 miles of roads at a cost of R11-8-0 per mile. Twenty-two miles of road was completed by the Public Works Department; but the corresponding expenditure was not reported. This road construction, as well as other works, such as the building or repairs to wells, develope and improve the forests and encourage traders to visit the Reserves. As regards buildings erected during the year, two rest-houses in the Bairagarh Reserve were completed at a cost of R3,100. The total expenditure incurred amounted to R11,337 for communications, and R7,169 on account of buildings.

Madras.—The sums expended on account of these works is indicated as follows:—

	Northern Circle.	Southern Circle.
	R	R
Roads	9,752	17,839
Buildings	13,422	17,652
Other works	826	446
TOTAL	24,000	35,937

The total expenditure does not practically differ in amount from that of the previous year. It is equivalent to only 5 per cent. of the total expenditure, and this proportion is, in the opinion of the Madras Government, quite inadequate for the proper opening out of the forests.

Bombay.—It is satisfactory to learn from a perusal of the Report of the gradual opening out of the forest areas by means of roads; and the successful disposal of standing timber to contractors, which is one of the most striking features in the development of forestry in Bombay, is no doubt to a great extent due to the increased facility of transport. Much, however, remains to be undertaken with a view to the full utilization of the valuable forests in the Southern Circle, where R4,685 was spent on buildings, but only R809 on roads and other works. In the Northern Circle, the amount expended on roads, by the Department was only R788. But large sums were expended by the Public Works Department on roads, which will greatly facilitate the transport and sale of forest produce. These works were, for the most part, undertaken at the instance or under the advice of local Forest Officers. Rupees 1,193 were expended from forest resources on repairs to buildings by Officers of the Public Works Department. Rupees 2,928 were expended in the construction of or repairs to forest guard's quarters and such like buildings. The total cost incurred by the Department in the Northern Circle on all works of the kind was R3,744. In the Sind Circle the work undertaken and expenditure incurred upon roads and buildings was trifling, amounting only to R285.

CHAPTER II.

PROTECTION AND IMPROVEMENT.

I.—General Protection.

15. The percentage of convictions has again increased, which clearly proves that the people of the country are not unnecessarily harassed by the application of the Forest Police Law:—

Provinces.	Number of cases taken into Court.		Number of cases compounded.		Total.		Proportion of Convictions to the total number of cases decided by the Courts.	
	1889-90.	1888-89.	1889-90.	1888-89.	1889-90.	1888-89.	1889-90.	1888-89.
							Per cent.	Per cent.
Bengal . . .	120	254	2,52	1,450	2,644	1,704	80	80
North-Western Provinces and Oudh	110	129	696	744	806	873	90	86
Punjab . .	1,106	1,348	880	998	1,986	2,346	78	68
Central Provinces .	293	213	8,261	7,303	8,554	7,516	75	76
Burma (Lower) .	341	365	899	403	1,240	768	94	88
Burma (Upper) .	99	9	47	16	146	25	81	93
Assam . . .	163	92	285	390	448	482	82	72
Coorg . . .	12	6	...	*	12	6	62	67
Ajmere . . .	31	56	205	230	236	286	97	100
Baluchistan . .	4	5	4	22	8	27	...	100
Andamans . .	...	...	...	...	...	...	...	...
Total .	2,279	2,477	13,801	11,556	16,080	14,033	82	73
Berar . . .	381	496	...	...	381	496	84	84
Total, Bengal Presidency.	2,660	2,973	13,801	11,556	16,461	14,529	82	75
Madras . .	2,333	2,432	1,698	1,324	4,031	3,756	70	72
Bombay . .	1,666	1,308	8,474	8,246	10,140	9,554	81	74
GRAND TOTA .	6,659	6,713	23,973	21,126	30,632	27,839	78	74

* Compensation to the amount of R67-4-0 was recovered for damage done to candal trees

16 *Bengal.*—The percentage of convictions obtained, which was the same as that of the previous year, remains lower than in several other Provinces. The cases compounded have increased in a remarkable manner in the Sundarbans Division, and if the increase, as stated by the Conservator is due merely to improved supervision, it shows conclusively that closer inspection was called for.

North-Western Provinces and Oudh.—In these Provinces it is especially noticeable that for some years past there has been an annually recurring decrease both in the number of cases taken into Court and in the number of those compounded. In the year under review, only 110 cases, as compared with 129 in the previous year, were prosecuted, and 696 cases, or 48 less than in the preceding year, were compounded. Considering the large forest area (nearly 4,000 square miles) to which these cases relate and the population concerned, this is a small number of offences. It is to be hoped that this result is due rather to a better understanding of the forest rules on the part of the people, than to an undue laxity in the administration of the law

Punjab.—There was a considerable decrease in the number of prosecutions instituted, as against the figures for 1888-89. The decrease on the present total has amounted to 30 per cent. during the past three years, but the percentage of convictions has increased, and now stands at 78·5. This percentage is, however, less than the average obtaining throughout the Provinces under the Government of India; so that apparently there is room for improvement; 880 cases were compounded for R2,828, principally in the Rawalpindi and Jhelum Divisions.

Central Provinces.—Although both the number of cases of breaches of the forest rules taken into Court and the number of offences compounded were greater than in the previous year, yet the progress made cannot be deemed very satisfactory.

The proportion of convictions to the total number of cases disposed of by the Courts was

low and even less than that of the preceding year; and the Government of India concurred in the view of the Local Government that this was due to want of care in the institution of proceedings. The amount paid to the Department on account of cases compounded was not reported.

Burma.—In Lower Burma fewer cases were taken into Court and a higher percentage of convictions obtained, and it is also satisfactory that a very much larger number of cases was compounded in the Pegu Circle, owing, the Conservator explains, to teak-taungya cultivators in the Reserves being punished for destroying teak trees within their 'yas' in spite of often repeated warnings. The encroachments described in the Conservator's Report show that the taungya-cutting population are ready to take advantage of any opportunity to resume their old nomadic habits. The sum of R14,567 was realized on compounding cases. The percentage of convictions in cases taken into Court (94) is the highest obtaining in any province in India, with the exception of Ajmere.

In Upper Burma there was a considerable increase in the number of prosecutions undertaken, and in the majority of the cases the offence was that of cutting green teak. It is the policy of the Local Government not to enforce the Forest Law with undue strictness at the commencement; but it is necessary to put a stop to the practice of removing green teak trees. Rupees 840 were realized on account of cases compounded.

Assam.—During the year under review the offences were, as usual, trifling. In all, 163 cases were taken into Court and 285 cases were compounded, as compared with 92 cases prosecuted in the previous year and 390 compounded. Convictions were obtained in 82 per cent. of the cases prosecuted, as compared with 72 per cent. the year before. The diminution in the number of cases compounded was due to the power to compound having been restricted to higher officers than has hitherto been the custom in the Province. Rupees 2,347 was realized on account of cases compounded, or an average of R8-3-9 per case.

Coorg.—The Government of India, when reviewing the progress of forest administration in Coorg during 1888-89, called attention to the fact that the protection of the forests against breaches of the forest rules was not good. It is, therefore, satisfactory to observe that more vigorous action was taken both as regards the prosecution of offenders and the punishment of forest subordinates for neglect of their duties. Advantage does not at the same time appear to be taken in Coorg as in other Provinces of the provisions for compounding offences in the Forest Act. No cases were disposed of in this manner during the year; and the reason for this has not been stated.

Ajmere.—The protection of the forest areas against trespass would appear to have been successfully accomplished. The offences against the forest rules were mostly of a petty nature, and their number was less than during the previous year. The percentage of convictions obtained continues still to be remarkably high. Two hundred and five cases were compounded during the year for a total of R342.

Baluchistan.—The new law came into force at the close of the year. Only 4 cases were prosecuted, resulting in two convictions. Four cases were compounded for a total of R6, and 1,965 cattle, grazing in closed areas, were impounded, being more than double the number pounded in 1888-89.

Andamans.—No prosecutions were undertaken, and no protective staff existed until the close of the year.

Berar.—As will be seen from the statement above, the number of prosecutions for breaches of the Forest Law fell from 496 in the preceding year to 381, while the percentage of convictions obtained remained the same. A perusal of the Conservator's Report tends to confirm the view that contraventions of the law pass undetected, and that prosecutions are not properly undertaken. These defects may be partially ascribed to laxity of supervision, although the want of co-operation on the part of local officials, complained of by the Conservator, may be accepted as explanatory of the inefficient protection of the scattered tracts. It is to be hoped that, with the anticipated strengthening of the protective staff, this state of things may improve.

Madras.—There was a slight decrease in the number of cases prosecuted, and an increase of 374 cases compounded. In the Northern Circle the number of cases was considerably less, and the percentage of convictions considerably greater, than in the previous year. In the Southern Circle there were more cases instituted, and the percentage of acquittals 30, as against 28 in 1888-89. The percentage of cases compounded was also considerably greater.

Bombay.—Taking all three Circles together there was an increase in the number of cases brought into Court and the number compounded, while the percentage of convictions rose by 7 per cent. This latter increase took place principally in the Northern Circle. On the other hand in Satara and in portions of the Southern Circle, the number of acquittals was high.

In the three Circles, 8,474 cases were compounded, principally in the Northern Circle, for a gross total of R22,937. The Bombay Government proposed to institute an enquiry into the working of section 67 of the Forest Act. The powers therein contained, while admirably suited for the punishment of petty offences, can be turned into a scourge if exercised by unscrupulous subordinates.

II.—Protection from Fire.

17. It will be observed from the subjoined table that the area under special fire-protection has increased during the year under review by 2,582 square miles, and the area actually protected, by 2,963 square miles. The extent of forest areas which are not subject to annual conflagrations, and which, consequently do not require special measures for their protection, are not included in the statement, but it would be advisable to enter estimates of such areas in each Provincial report, in order to obtain a reliable estimate regarding the ultimate extension of special fire-protection.

Province.	Area, in square miles.				Proportion of failures to area attempted.		Cost				Proportion of area under fire-protection to total area of Reserves (*Leased* forests included).	
	Attempted.		Protected.				Per square mile protected.		Per acre protected.			
	1889-90	1888-89.	1889-90.	1888-89.	1889-90.	1888-89.	1889-90.	1888-89.	1889-90.	1888-89.	1889-90.	1888-89
					Per cent.	Per cent.	R	R	Pies.	Pies.	Per cent	Per cent
Bengal . . .	1,217	(a)1,772	1,159	(b)1,288	5	27	13	13	4	4	23	35
North-Western Provinces & Oudh (c) .	2,199	2,054	2,075	1,922	5	6	18	19	5	6	(d)60	(e)56
Punjab . . .	427	402	334	393	22	2	7	6	2	2	(f)7	(f)7
Central Provinces .	2,887	2,502	2,712	2,397	6	4	13	13	4	4	15	13
Burma (Lower) .	379	342	374	303	1	11	52	57	16	17	(g)7	(g) 7
Burma (Upper) .	12	9	6	6	50	33	12	19	4	6	(h) ·1	·1
Assam . . .	1,057	(i)493	681	(j) 472	36	4	18	(k)19	5	(l)6	30	(m)14
Coorg . . .	202	201	196	116	3	42	22	31	7	9	84	83
Ajmere . . .	139	139	139	138	...	1	2	4	1	1	100	100
Total .	8,519	7 914	7,676	7,035	10	11	17	16	5	5	...	..
Berar . . .	1,059	1,063	1,043	1,044	2	2	7	7	2	2	100	100
Total, Bengal Presidency(n) . .	9,578	8,977	8,719	8,079	9	10	16	15	5	5		...
Madras . .	4,609	3,169	4,395	2,888	5	9	8	12	2	4	(o)	(o)
Bombay . .	10,638	10,098	9,130	8,314	14	18	1	1	·44	·19	(p)	(p)
Grand Total .	24,825	22,243	22,244	19,281	10	13	8	8	3	3	...	...

(a) Included 32 square miles of proposed Reserves.
(b) Shown incorrectly as 1,291 square miles in the Report for 1888-89. Included 31 square miles of proposed Reserves.
(c) Fire-protection in the Central Circle extended over *Protected Forests* as well as Reserves, and in that Circle the area attempted to be protected included tracts for which no special fire-protective measures were taken.
(d) In Oudh 64 per cent, in School Circle 78 per cent.; in Central Circle (taking Reserved and Protected Forests into account, as done by the Conservator) 48 per cent.
(e) In Oudh 63 per cent.; in School Circle 78 per cent.; in Central Circle (taking Reserved and Protected Forests into account, as done by the Conservator) 40 per cent.
(f) Proportion of area under fire-protection to total area of all forests.
(g) Taungya areas not included.
(h) Proportion of area under fire-protection to area of Protected and Unclassed Forests.
(i) Shown incorrectly as 506 square miles in Report for 1888-89.
(j) Shown incorrectly as 485 square miles in Report for 1888-89.
(k) Shown incorrectly as R18 in Report for 1888-89.
(l) Shown incorrectly as 5 pies in Report for 1888-89.
(m) Shown incorrectly as 15 per cent in Report for 1888-89.
(n) Fire-protection was extended to Protected Forests (Reserved Lands) as well as Reserves, including Leased Forests, and the area attempted to be protected included tracts for which no special fire-protective measures were taken.
(o) No comparison possible, as the area attempted was greater than the area of Reserves.
(p) No comparison possible, as the areas proposed for reservation are also included in the area attempted.

18. *Bengal.*—The results of fire-conservancy for the year, as indicated in the above statement, are more apparent than real. The 555 square miles of forests in the Singbhum Division, the protection of which mostly failed in 1888-89, was not attempted in 1889-90, and the area was consequently omitted from the returns. These tracts were traversed by fires during the year, and their non-protection was seemingly due to a neglect of orders. The cost of protection remained the same as for the previous year.

North-Western Provinces and Oudh.—The fire-protective measures undertaken during the year were satisfactory, although the season was unfavourable. The area, the protection of

which was attempted, was somewhat greater than that in the year before, yet the area burnt was less and only amounted to 5 per cent. of the total under special protection : the cost was also lower than in 1888-89. A large number of destructive fires, which originated while burning the fire-lines, or were due to these lines being insufficient to prevent fires from crossing them, was specially noticed by the Local Government. In the School Circle, 8,009 acres were burnt by fires due to preventible causes; while in the Central Circle carelessness in the burning of the fire-lines caused ten fires, aggregating 4,164 acres. The subordinate forest officials would appear to have been either insufficiently instructed or supervised.

Punjab.—In this Province special measures for the protection of the forest from fire are more nominal than real, consisting for the most part in the retention of scattered fire guards whose beats are often of enormous extent. During the year under review, the result of fire-protection was more than usually disastrous as regards both the number and the extent of the areas burned. Of the specially protected areas, nearly 60,000 acres, chiefly in the Hazára and Ráwalpindi Divisions, were entered by fire, which also passed over more than 38,000 acres of forests, for the protection of which no special measures are taken. It is noticeable, too, that the cost of protection is continually increasing, notwithstanding that the results are yearly less favourable. The Local Government expressed a willingness to consider special measures for the prevention of these fires, which periodically devastate the forests in the north-west portion of the Province. There can be little doubt that much remains to be done in the shape of fire-protection by fire-lines or otherwise.

Central Provinces.—While the percentage of failures amounted during the year to 6 per cent. as against 4 in the proceding year, the result of the season's protection was not at all unfavourable, because the area taken in hand and that actually protected were considerably greater than in the previous year. The cost of protection remained unchanged. The regulations issued by the Chief Commissioner regarding the firing of lands adjoining the forests were continuously successful.

Burma.—The results of fire-protection in Lower Burma were markedly successful during the year. Although the area taken in hand exceeded that of the previous year by 37 square miles, the percentage of failures amounted only to 1 as against 11 during 1888-89, while the cost per square mile was reduced from R57 to R52. It is to be regretted that fire-protection was least successful in the important Tharrawaddy Division, and that so considerable an area of plantations as 461 acres were traversed by fires. It is understood that special measures were to be devised for combating fires in this Division.

In Upper Burma it was reported that forest fires prevailed generally, and that all the teak forests, with the exception of those in the Pyinmana Division, were believed to have been burned over. But systematic fire-protection has not as yet been attempted. The settlement and demarcation of the permanent Reserves evidently must precede their protection and improvement; and the energy of the forest staff is properly directed in the first instance to these measures.

Assam.—The feature in the fire-protection during the year has been an exceptional failure, such as has not occurred within the past twenty years; 36 per cent., or 376 square miles, of the area over which protection was attempted having been burned. These fires, although partly caused by incendiaries, would appear to have been chiefly due to a too sudden extension of the area under protection, which was increased from 493 square miles in 1888-89 to 1,057 square miles during the year under review. The protection of such an extended area was evidently beyond the powers of the available staff.

Coorg.—The results of fire-protection were especially good, and show a great advance on the returns for 1888-89. The failures amounted to only 3 per cent. of the area attempted to be protected, while the cost was reduced by R9 per square mile. This improvement is doubtless due, to a considerable extent, to a more favourable season; but it is probable that it may be partially attributed also to the adoption of more stringent measures and to the maintenance of better discipline amongst the protecting staff. It is satisfactory to observe the greater attention which has been given during the past year to the important work of fire-protection, the need for which has hitherto been so markedly apparent.

Ajmere.—The protection of the forests against injury by fire would appear to have been successfully accomplished during the year. The result was exceptionally satisfactory, only two insignificant fires, which burnt over 7 acres, having occurred during the year. The cost of fire-protection was reduced to less than one-half of what it amounted to in 1888-89, owing, it is explained, to the fire-lines having been burnt free of charge in return for the grass growing on them. The adoption of this system in future years will, it is hoped, be encouraged.

Baluchistan.—No fires occurred in forests managed by the Department.

Andamans.—The forests in these islands are not subject to fires, and none occurred during the year.

Berar.—Fire-protective measures were specially successful, the results being almost identical with those of the previous year. Failures are reported over an area of only 16 square miles, which is about 2 per cent. of the area "attempted." Of the area entered by fire, 6,529 acres in the Buldána District were devastated owing to the carelessness of the officer in charge. The marked improvement in the protection of the forests of the Wún District, which had hitherto been unsatisfactory, is a prominent feature in the fire-conservancy record of the year. The cost of protection remains unchanged.

Madras.—The results of fire-protection during the year were most satisfactory. Protection extended over an additional area in both Circles of 1,440 square miles; yet the percentage of failures was reduced by 4 per cent., and the cost per square mile by 33 per cent. In the Southern Circle, the fire-traced area was increased by 408 square miles, 99 per cent. escaped, being 2 per cent. more than in 1888-89, and the cost was reduced from R13 to R10-10-5 per square mile. In the Northern Circle 1,033 square miles were added, of which 92·5 per cent. escaped as against 86 per cent. in the previous year. It was pointed out by the Board of Revenue that the high cost of protection is necessary and is justified by the size and kind of forests concerned.

Bombay.—The following table illustrates the distribution of the totals given in the above general statement, and shows that the percentage of failures to the area attempted was largest in the Northern Circle, where, however, the attempt was made to exclude fires from the whole forest area, whereas only 56 per cent. was under protection in the Southern and 61 per cent. in the Sind Circle. The general cost of protection, however, per square mile, rose from R0·63 in 1888-89 to R1·48 in the year now reviewed :—

Circle.	Area, in square miles.			Proportion of failures to area attempted.	Cost		Proportion of area under fire-protection to total area of Reserves.
	Attempted.	Failures.	Protected.		Per square mile protected.	Per acre protected.	
				Per cent	R	Pies.	Per cent.
Northern . . .	9,022	1,382	7,640	15	·28	·08	*
Southern . . .	1,016	124	892	12	12·73	3·82	56
Sind	600	2	598	·33	...	...	61

* No calculation possible, as areas *proposed for reservation* are also included in the area attempted.

III.—Grazing.

19. The question of forest-grazing influences, on the one hand, forest management more intensely in India than in countries situated in temperate zones and, on the other, is of more vital importance to the population, who, even where no physical necessity exists for it, are wedded by custom and habits to a system of husbandry greatly dependent on large grazing areas. Thus the interests of agriculture and of State forest management appear to clash, especially in the drier regions of the Empire where long seasons of drought seem to prohibit a more advanced stage of agriculture than that which, as an inheritance of centuries, exists at present, but where at the same time the existence of forests and their maintenance is of special value not for the production of timber, but as a means for the storage of moisture.

The question where and to what extent the administration should interfere with a long existing and gradually developed custom, is one of extreme difficulty, surrounded by many and varying side-issues, and dependent on local, climatic, physical and political conditions. It is impossible to lay down a general rule regarding the obligations of Government; and the action required and feasible must, in each case, depend on a local analysis of all circumstances.

Experience has shown that such enquiries and subsequent action are, as a rule, most backward in those localities where State interference is most urgently called for. This is, to a certain extent, natural; for in such places drastic measures alone would be effective, and interference on the part of the Government would find the greatest opposition.

Nevertheless, however disagreeable it may be to take the initiative and the responsibility of decided steps, it cannot be denied that the position does not improve by waiting, and that the measures as yet adopted are frequently inadequate to secure a thorough forest protection even of the catchment areas of the numerous streams rising in the lower hills and debouching into plains blessed with a naturally fruitful soil, which is sterile only on account of the want of a perennial water-supply. It is a well-known fact that extensive areas exist in India which were once fruitful and populated; and with the example of Ascension Island (which was recently quoted in the *Indian Agriculturist*) before us, it can hardly be doubted that they would become fruitful once more with a thorough afforestation of the lower hills on which they are dependent for their water-supply. At present such areas are increasing in extent. An intelligent and comprehensive examination of the whole question, district by district, has recently been prescribed by the Government of India, and thus, it is hoped, much additional light will be thrown on this difficult problem of administration. Managed on a sound system, the forest reserves will afford a much more secure supply of grass available in years of scarcity than would be provided if all grazing lands were without exception excluded from the reserved areas. This principle has been satisfactorily proved. Open grazing lands fail where they are most needed.

The worst features of forest-grazing in many parts of India are the extent to which browsers, more especially goats, are admitted, and the wilful firing of forest areas open to grazing.

20. *Bengal.*—The following table, furnished by the Conservator, gives particulars of areas grazed over:—

	Closed to animals.	OPEN TO				Total Area.
		Elephants, Camels, Buffaloes, Goats, Sheep, or other Cattle.		Cows, Bulls, Bullocks, or Ponies.		
		Heavy grazing.	Light grazing.	Heavy grazing	Light grazing	
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Reserved Forests . .	2,370,039	47,268	636,121	...	271,581	3,325,009
Protected " . .	1,223,222	209,868	...	...	...	1,433,090
Unclassed " . .	2,581,420	...	...	...	...	2,581,420

This statement furnishes more detailed information than has hitherto been recorded in regard to this question. Forty-one thousand two hundred and fifty-four acres were shown in the Darjeeling Division as open to heavy grazing by all animals, including elephants, camels and goats. But it would appear from the Conservator's Report that only horned cattle and sheep actually grazed over them. Moreover, it is gathered from the same source that, with the exception of an insignificant number of goats and elephants, browsing animals are not admitted into the forests of Bengal. If this is the case, only 74 square miles, of the 5,195 square miles of Reserves, are open to what the Conservator describes as heavy grazing, and 1,418 square miles to light grazing. The total receipts from pasture and fodder-grass amounted to R11,079.

North-Western Provinces and Oudh.—The areas closed to grazing during the whole or part of the year were as follows :—

Circle.	Total area under forest management.	Area closed to grazing.	Percentage of whole area closed.
	Sq. miles.	Sq. miles.	
Central	1,771	1,031	58
Oudh	1,203	543	45
School	816	237	29
Total	3,790	1,811	48

The fees received for grazing amounted to R96,724, as compared with R1,02,728 in the previous year; but the decrease is due to grazing revenue not being realized during the year to which it belonged A relatively small area was closed to grazing in the School Circle, and the Government of India, in reviewing the progress made, remarked on the delay which took place in regulating grazing in the Dehra Dun Division.

Punjab.—The total area affected amounted to 1,682 square miles, being 116 square miles in excess of the figures for 1888-89. An additional are of 62 square miles has been closed to browsers for a portion of the year. There were, however, decreases of 4 square miles complete closures, and of 13 square miles closed to browsers throughout the year; so that it is not sure that the net result has been an improvement on the pre-existing state of things. It is probable that much could be done in this Province in increasing the area at present closed to browsers, especially in regard to the lower hills underlying the Himalayas, which contain the natural sources of numerous streams, which now, however, are dry during the greater part of the year, in consequence of the denuded state of the hill-sides.

Central Provinces.—From the information furnished by the Conservator it would appear that, omitting certain localities from which no returns were received, grazing was more or less controlled in 1,460 out of a total area of 17,030 square miles for which returns were submitted, and that it was entirely excluded during the whole year from 1,320 square miles or 8 per cent. of this area. The number of animals for which grazing permits were obtained amounted to over three millions, or to about one animal to every 4 acres of open forest. The information supplied on this subject will not, however, be of much value until those areas in which the principal product is fodder, and those which it is necessary to treat permanently with a view to the production of wood, have been separated and classified. The importance of making grazing subservient to sylvicultural treatment as regards the latter class of areas, is fully comprehended by the Local Government. On account of grazing fees and sale of fodder, R5,63,906 were realized, as against R5,33,714 in the preceding year. The increase was due to grazing fees, grass sales having fallen by R11,893 during the year.

Burma.—But little information has been recorded upon this question by the Conservators in Lower Burma. A few cattle were allowed to graze within reserves in the Pegu Circle. It is stated also that, in this Circle, much illicit grazing takes place inside Reserves in the plains. Nothing has been recorded as regards grazing for the Upper Burma forests.

Assam.—The question of forest-grazing is not of importance in this Province; and nothing has been reported on the subject during the year under review.

Coorg.—It is stated that grazing dues in the Reserves were paid for 10,407 cattle. It is understood that the only important matter connected with this subject is the unsettled question as to the number of cattle to be admitted to graze of right. From the Report it would appear that the reproduction in several of the Reserves depends materially on the decisions that may be come to on this matter.

Ajmere.—Nearly all the Reserves were open to grazing from the 1st of March to the end of June. Sixteen thousand two hundred and ninety-two cattle were admitted on payment, or nearly 2,000 more than in 1888-89. Grass, estimated to amount in value to R82,416, was removed from the forest by right-holders or free-grantees; and the Commissariat Department was supplied with fodder valued at R2,700.

Owing to the partial failure of the rains and a scarcity of fodder, the whole of the reserved area, with the exception of some 2 square miles, was thrown open to grazing during a part of the year. The reservation of forests has thus been of practical service to the population. But, in view of the relatively small area reserved and of what has been recorded regarding the injurious effect of grazing on reproduction in Ajmere, it may not always prove to be in the interests of the people that all the reserved areas should be grazed over even in years of scarcity. The question is one which can only be determined with due regard to the object with which

the reserved areas are maintained, as well as the local circumstances affecting them; but it is obvious that, under any circumstances, a system of exploitation by cattle involves much waste, as the animals trample down and injure more than they eat. It would seem advisable, therefore, that the question of the closing a material proportion of the Reserves to grazing and of permitting only the *cutting* of grass and fodder should be further considered.

Baluchistan.—The forests of Ziarat and Zarghun and a portion of the Gwál area were closed to grazing, as were also the forests of Popalzai and Torkhel. The Sibi rukhs, with the exception of the exploited portions, were open to grazing, the fees realising R259.

Andamans.—It is reported that cattle do not graze in the forest, although the grazing land outside available to self-supporter convicts is insufficient.

Berar.—It was reported by the Conservator that grazing in the demarcated State Forests had been put an end to everywhere except in those of Buldána. Cultivation has been so much encouraged in this district and the waste lands absorbed to such an extent that the cattle are, in some degree, dependent for their grazing on the only two timber Reserves which exist in this part of the Province. The Conservator states that the only courses will be either to reduce the area of these forests or to work them on a plan which will provide for the periodic closing of alternate blocks of forest. The coppice Reserves of South Akola will also probably become similarly situated. The Conservator recorded his views on this subject and sketched a plan for the future working of these areas in an appendix to his Report. The relations with the Department of the Izardars of Wún, who claim exemption from the payment of grazing dues, is to be enquired into at the approaching re-settlement of the Buldána District.

Madras.—No information has been given in the Conservator's Report as to the areas grazed over and those closed to grazing during the year, or regarding the average number of cattle grazed per acre; and nothing has been recorded about the progress made in grass-cutting and hay-making. It is only by such statistics that the policy pursued with regard to the utilization of the grass supply in Forest Reserves can be correctly gauged, and accordingly it is to be hoped that details on these matters may be included in future Reports.

The Government of India, when reviewing this question, acquiesced in the opinion of the Madras Government that the chief object of imposing a fee upon grazing is to restrict the number of animals grazing in the forests, but stated that these fees should vary with the locality and the local value of pasturage; and added that, ordinarily, the number of animals grazed should be restricted to the number which the area can support with due regard to the production of timber or wood. Where a limit of number has been so fixed and moderate maximum fees have been laid down in the interests of the people, it would seem a matter of small importance whether the fees are realized by means of permits or by auction-sale. The latter method, however, might encourage the influx of herds from beyond the immediate neighbourhood to the exclusion of local cattle, and is consequently only desirable under exceptional circumstances, as when the area grazed is to be treated as a grass farm.

Bombay.—In the Southern Circle, 311 square miles were closed to grazing as against 84 square miles in 1888-89. The revenue in this Circle shewed an increase on the figures of the previous year of R5,485, of which R4,197 were realized in the Belgaum Division. The improvement in the revenue under the new grazing regulations was not so great as had been anticipated.

In the Northern Circle, the area open to grazing on payment of fees remained much the same as in 1888-89, but that open to free-grazing was increased from 975,993 to 2,283,573 acres. The net area closed to grazing was increased from 633,175 acres to 872,777 acres. The total grazing revenue was raised from R3,27,165 to R3,42,037.

From the Sind Circle, the information reported on this head was meagre. It was stated that the grazing year was good owing to the inundations having been high, and that 4,458 animals, which did not include browsers, were permitted to graze free.

In reviewing the progress made in the three Circles the Government of India remarked that the number of cattle impounded was large, but included a considerable number of animals driven into the open forest area without grazing passes, the owners preferring the chance of being subjected to the pound-fines to the certainty of paying the grazing fees. This practice should possibly be checked by raising the pound-fines under section 70 of the Forest Act, and this question appears to be under the consideration of the Bombay Government.

The Government of Bombay contemplate the removal of grass from the areas under reproduction either by the cultivators themselves or by contractors. The greatest caution in such a proceeding is desirable; for it is not only almost impossible, under such a method, to prevent the destruction of young growth, especially of the more important tender seedlings, but the very removal of shelter may be harmful to reproduction in its earlier stages.

IV.—Natural Reproduction.

21. The study of natural forest reproduction in India is, considering that almost throughout the Empire we must depend on it for the future of our forests, of the very greatest importance, and at the same time represents, owing to the diversity of climate and conditions, varieties and difficulties not experienced and almost unknown in Europe.

In some localities—Assam, Burma, Bengal, Bombay—the vegetation is so luxuriant that the contest in favour of the few representatives of tree-vegetation, which it is desirable to favour on account of their special value, presents difficulties which exercise to the utmost the ingenuity of the Forest Officer, and which are frequently insurmountable on account of the expense; whereas in other parts of the country, as for instance Baluchistan, it is only in exceptionally favourable years that seedlings can establish themselves.

In some localities, the reproduction takes place only under the influence of inundations, and in others is entirely dependent on spring tides.

The field for study regarding this particular question of forestry is almost inexhaustible, and annual reports in regard to the latter might with advantage be made more interesting and valuable.

22. *Bengal.*—The remarks recorded by the Conservator on natural reproduction in the Darjeeling, Jalpaiguri, and Chittagong Divisions are indicative of careful observation. The opening of the Reserves in the Orissa Division to free-grazing—a course which has to be taken in times of scarcity—resulted in injury to, and the destruction of, *sál* seedlings.

North-Western Provinces and Oudh.—The season was favourable to natural reproduction. *Sál* seeded plentifully in the three Circles; the deodar but to a small extent; while there was a marked absence of chir seed. The beneficial effect of fire-protection has again been noticeable, especially in the Jaunsár forests of the School Circle. It is stated that in the submontane tract of the Central Circle further reproduction is impossible, until the crops are thinned out. This is owing to the overhead cover, resulting from efficient fire-protection.

Punjab.—The detailed and interesting remarks on natural regeneration given in the Conservator's Report are worthy of special notice.

In the higher hills, the reproduction of deodar is generally plentiful, and the statement made regarding the absence of reproduction in certain too heavily exploited forests in Kulu is perhaps questionable.

Presuming that the Conservator's remarks apply to demarcated areas which it is proposed to maintain permanently as forest, further inquiry is obviously desirable, and, if they are found to be correct, precautions under the provisions of a working-plan should be taken against the continuance of a system which points to the extermination of valuable deodar forests.

The conditions regarding the reproduction of spruce and silver-fir, have as yet been insufficiently studied. It is probably only necessary to take sufficient precautions against fires and excessive grazing to insure, wherever there is sufficient light, reproduction of both *Pinus excelsa* and *P. longifolia* when local conditions are otherwise favourable. The greater facility with which northern and eastern as compared with southern and western aspects clothe themselves, is not, it is believed, at any rate at some elevations, so marked in the case of these species as in that of others of the Himalayan forest trees.

The object in the lower hills should be to cover the soil as quickly as possible, and to this end *Dodonæa viscosa*, owing to the facility with which it reproduces itself both from coppice and seed, is a valuable auxiliary species. Such growth will slowly be replaced by more valuable woods in course of time, provided that browsing and over-grazing be checked.

In the plains of the Punjab, reproduction by means of root-suckers and coppice-shoots must be the mainstay of the forest growth, and it appears doubtful whether, where protection is desirable, the exclusion of browsing animals only will suffice in those unreserved areas of the *bár* lands in which fellings have been recently made. Cattle, such as roam over these tracts in a half-starved condition, browse within their reach almost as disastrously as camels or goats.

Central Provinces.—The remarks on this subject contained in the Conservator's Report are, in some instances, not precise. It is satisfactory to find that in most cases reproduction is all that can be desired in forests which are protected from fire and grazing, and it is hoped

that the extension of such protection to all areas which are intended mainly for the production of wood will be kept steadily in view.

Burma.—In respect of Lower Burma, the remarks made in the last Review regarding natural reproduction in the Attaran and West Salween Divisions hold good. In certain parts of the East Salween Division, fire-protection has resulted in an improvement of the reproduction, which has, however, been hindered by a plague of small caterpillars which have attacked the teak forests in the Taungyin and in part of the Salween valleys. It has been found that the reproduction is excessively slow in localities unprotected from fire, and that trees 6 to 10 inches in diameter proved to be from 30 to 50 years of age. Fire, then, must be considered to be the agent which chiefly militates against teak-reproduction.

As regards Upper Burma, the Conservator's report confirms generally what was said last year in this respect. In the Bhamo Division, and in part of Momeik, the dense undergrowth prohibits all reproduction, and the over-exploitation of such tracts results in the extinction of the teak. Where the growth is not so thick, conditions are less unfavourable, and in part of Maingtha, Kun, The, and the Sekkala forests in Momeik the reproduction was all that could be desired.

Assam.—Natural reproduction in the climate of this Province is nearly always abundant, and in the evergreen forests, where the demand is small, seldom requires any assistance. The extension and reproduction of the *sál* forests is, as a rule, sufficiently provided for by keeping out fires. And it is, therefore, regrettable that such large tracts should have been burned during the year under review.

Coorg.—The paragraphs of the Deputy Conservator's report relating to natural reproduction are interesting, and tend to shew that the forests must be improved by aiding natural reproduction by cultural operations rather than by the creation of independent and artificial plantations of teak and sandal.

Ajmere.—The Chief Commissioner states that natural reproduction by which, apparently, seedling growth is intended, has not been satisfactory, and is attributed to the excessive grazing to which the Ajmere-Merwara forests are year by year subjected. Coppice-growth, on the other hand, is stated to have been satisfactory. In this connection it is stated that "natural seedlings are coming up under the parental trees, and the Sub-Assistant Conservator entertains hopes of their surviving, as these areas are altogether excluded from grazing."

Baluchistan.—The year under review was unfavourable owing to deficiency of snow and winter rains. It is reported that the Gwál pistachio forest is slowly improving, and some seedlings were found here, and also in the juniper forest of Zarghun; while the tamarisk in Popalzai is growing rapidly, and in some places forms complete cover.

Andamans.—From a perusal of the Deputy Conservator's report, it would seem desirable that the work of opening out the canopy round mature padauk trees should be undertaken at once, in order to ensure the establishment of a crop of seedlings to replace the mature trees. It does not seem wise to defer this important work until the actual time when the girdling or removal of the mature trees will be undertaken.

Berar.—The remarks made on this subject in the Review for 1888-89 may possibly require considerable modification. For the Conservator, it is observed, has, after inspection, considerably altered his views regarding the condition of natural reproduction in the South Berar Forests. His report is now to the effect that teak seedlings are not infrequently met with wherever the protecting influence of *Zizyphus* or other growth is present. The reproduction of inferior species he also states to be sufficiently good, so that, on the whole, wherever fire-protection has been successful, the future of the forests would seem to be more certain and assured than might have been thought to be the case in view of the information furnished for the past year.

Madras.—The remarks on natural reproduction, although the subject can only be dealt with in a broad and general manner in Annual Progress Reports, are interesting. The Board of Revenue state that the Forest Staff has hitherto been occupied in securing Forest Reserves, in organizing fire-protection, and in other works of primary importance; but that it will now be necessary to study the sylvicultural requirements of the forest areas in charge of the Department. These observations appear useful and to the point. It might be well that Forest Officers should record their individual observations regarding important trees. For information of this kind, derived from continuous local observation, is the best foundation for progress in sylviculture.

Bombay.—Natural reproduction by seedlings and coppicing was apparently good in all three Circles except in the case of certain Reserves in Sind which no longer benefit by inundations. The interesting remarks recorded on this subject tend again to show that, in order to preserve and enhance the productive capabilities of the forests, little is needed beyond the total

exclusion of fires, systematic exploitation, and a thorough regulation of grazing. It is, therefore, satisfactory to observe the desire of the Bombay Government to meet in all these directions the requirements of the forest property in their charge.

V.—Sowing and Planting.

23. The area of regular plantations has been increased by 2,744 acres, but at the same time 2,027 acres of incompletely-stocked areas were excluded, leaving a net increase of only 717 acres. The teak taungya plantations in Burma, which are for all practical purposes on a par with regular plantations, show a net increase of 3,487 acres, and comprise now an area of 19,606 acres. Considering that these areas are selected with a view to easy export of the mature material, such plantations, and the considerable annual increase thereof which is now assured, add considerably to the future possibility of the forests and must be regarded as a most important factor in their future management. It seems advisable that this method should receive more attention in other parts of India. As yet the attempts in this direction have been sporadic and have failed, but there is no reason why better results should not be obtained by a more careful study of the conditions obtaining in Burma and the means adopted to secure success. The area of cultural operations is mainly made up by Bombay. Here large tracts of forest land are year after year treated by broadcast sowings, and favourable results of these operations are reported. Whether, however, and to what extent, the same area is included more than once in the plantation statement, is a doubtful point which should be elucidated.

The area of plantations and cultural operations undertaken during the year is exhibited in the following table :—

Plantations.

Province.	Area, in acres.															
	At commencement of the year.				Added during the year.				Excluded during the year.				Balance at the close of the year.			
	Regular Plantations.	Cultural Operations.	Taungyas.	Total.	Regular Plantations.	Cultural Operations.	Taungyas.	Total.	Regular Plantations.	Cultural Operations.	Taungyas.	Total.	Regular Plantations.	Cultural Operations.	Taungyas.	Total.
Bengal	2,896	981	...	3,877	116	18	...	134	...	...	...	...	3,012	999	...	4,011
North-Western Provinces and Oudh	2,872	2,852	...	5,724	...	178	...	178	100	82	...	182	2,772	2,948	...	5,720
Punjab	14,131	6,024	...	20,155	511	1,081	...	1,592	441	449	...	890	14,201	6,656	...	20,857
Burma (Lower)	3,868	3,324	16,119	23,311	30	...	3,787	3,817	...	...	300	300	3,898	3,324	19,606	26,828
Burma (Upper)	...	...	...	...	2	...	...	2	...	...	...	...	2	..	...	2
Assam	1,463	148	...	1,611	444	20	...	464	...	...	...	...	1,907	168	...	2,075
Coorg	1,327	88	...	1,415	147	11	...	158	23	89	...	112	1,451	10	...	1,461
Ajmere	489	...	...	489	42	...	...	42	...	...	...	...	531	...	...	531
Baluchistan	144	43	...	187	377	1	...	378	...	...	...	...	521	44	...	565
Andamans	59	...	...	59	22	...	...	22	...	...	...	...	81	...	...	81
Total	27,249	13,460	16,119	56,828*	1,691	1,309	3,787	6,787	564	620	300	1,484	28,376	14,149	19,606	62,131
Berar	1,409	11,418	...	12,827	...	869	...	869	1,409	9,906	...	11,315	...	2,381	...	2,381
Total, Bengal Presidency	28,658	24,878	16,119	69,655	1,691	2,178	3,787	7,656	1,973	10,526	300	12,799	28,376	16,530	19,606	64,512
Madras	44,700†	4,621‡	...	49,321†	634	753	...	1,387	27§	...	...	27§	45,307‖	5,374¶	...	50,681‖
Bombay	7,675	208,242	...	215,917	419	39,791	...	40,210	27	2,026	...	2,053	8,067	246,007	...	254,074
Grand Total	81,033**	237,741	16,119	334,893**	2,744	42,722	3,787	49,253	2,027††	12,552	300	14,879††	81,750‡‡	267,911	19,606	369,267‡‡

* Erroneously entered as 56,851·36 in previous return, due to 23 acres, burned in Coorg in February 1889, not having been excluded.
† Includes 25,763 acres of topes.
‡ Entered as 4,622 in previous return, a credit of 1 acre having been given for half an acre.
§ Includes 20 acres of topes.
‖ " 25,743 acres of topes.
¶ Besides 100 miles of channel banks.
** Includes 25,763 acres of topes in the Madras Presidency.
†† " 20 " " " "
‡‡ " 25,743 " " " "

24. *Bengal.*—The regular plantations were extended by 116 acres, mainly additions to the Dooteria plantation in Darjeeling, the Sitapahar plantation in Chittagong, and the Barunai Hill plantation in Khorda. Cultural operations were limited to some broadcast sowings of *sál* and *Macaranga denticulata* over 14 acres in the Jalpaiguri Division, and the treatment of a few acres in Khorda. An expenditure of R6,604 was incurred on plantations and cultural operations.

North-Western Provinces and Oudh.—There is little to record with regard to the cultural operations carried out. No additions were made to the area under regular plantations in any of the circles, and the areas subjected to improvement sowings or plantings were slight. One hundred acres of regular plantations were written off. The expenditure incurred was R7,958 as against R7,287 in the previous year. Orders were also passed by the Local Government that the cultivation of vegetables by the Forest Department should be discontinued.

Punjab.—The net addition to regular plantations, after deducting failures, was 70 acres only; and, similarly, 632 acres were added to the area previously treated under cultural operations. The expenditure incurred amounted to R27,916.

Central Provinces.—It is a matter for regret that cultural operations, having for their object the improvement of the forests, have not as yet been undertaken to any large extent in these Provinces; and a larger proportion of the expenditure might in the future be advantageously devoted to such works. During the year under review, only R922 were expended on plantations, and R1,168 (which was, however, more than recouped by the sale of the material cut) on improvement fellings. This expenditure does not amount to one rupee to every ten square miles of the area under the control of the Department, and cannot have had any material influence on the improvement of the forests. The "improvement cuttings" which it is stated by the Conservator were carried out over an area of 12,273 acres in the Mandla Division, would not appear to have been a very thorough operation, as it is explained that the cost was only R40, and merely consisted in the felling of 325 ill-grown trees.

Burma.—Slight additions only, aggregating 30 acres, were made to the regular plantations of the Pegu Circle at Kyetpyugan and Magayi.

The area under taungya plantations was enlarged in the Pegu Circle by 215 acres of teak and cutch mixed, and 2,316 acres of pure teak; while 1,170 acres were fully stocked and 86 acres partially with teak in the Tenasserim Circle. The Conservator of the Pegu Circle excluded from his returns all areas having fewer than 500 seedlings per acre, whereas the Conservator of the Tenasserim Circle records 86 acres, with less than 400 plants per acre. An uniform standard in both Circles is desirable. The entire area planted during the year under review was 3,787 acres. The Tenasserim Circle contributed nearly double the area of the previous year, and in the Pegu Circle no less than 2,531 acres were cultivated, compared with 1,810 in 1888-89. These results show conclusively that the Karens are appreciating the benefits which they derive from being employed to plant teak in the areas cleared by them for temporary cultivation. The total cost of all cultural work of this kind in Lower Burma amounted to R57,059.

The area of plantations, &c., in the two circles stood at the close of the year as follows :—

Circle.	Area, in acres, of			
	Regular Plantations.	Taungya Plantations.	Cultural Operations.	Total.
Pegu	3,875	13,972	3,213	21,060
Tenasserim	23	5,634	111	5,768
Total	3,898	19,606	3,324	26,828

In Upper Burma the work carried out was of a trifling nature. The expenditure amounted to R2,969.

Assam.—The plantations of rubber were successfully extended by 432 acres. Twelve acres of Khair (*Accacia Catechu*) and 20 of Ajhar (*Lagerstræmia Reginæ*) were also planted in view of the assured importance in the future of rubber plantations to the Province and for other reasons. The Government of India, in reviewing progress for the year, observed with satisfaction the work that had been done, and trusted that continued efforts might be maintained in this direction. The efforts which are being made to induce the people who practise *jhuming* to plant timber trees in their plots of cultivation were continued with industry, though with poor results, during the year under review.

Coorg.—Of the total of 1,451 acres, 427 were under sandal, 886 under teak, and the balance of 138 acres represented the fuel plantation at Mercara. It was remarked by the Government of India that, but for the fire in the Bakka plantation, the extensions of the year under review would have shown a considerably reduced rate per acre. Notwithstanding the destruction on that occasion of 23 acres (which area was erroneously entered in the closing balance of the previous year), it would appear that the new areas cost, exclusive of outlay on the preparation of the ground in the previous year, less than R20 per acre. The maintenance charges are exceptionally high in the case of the sandal plantations, but were explained by the Deputy Conservator as being due to unusual outlay on account of fencing.

Ajmere.—The improvement of the forests by artificial reproduction appears to have been carefully attended to, and plantations were extended as far as the funds available permitted. It is probable, however, that improvements on a large scale can only be effected through the protection of the forests from injury, more especially from injury by grazing and browsing. In this connection the remarks made on the subject of natural reproduction in the Sub-Assistant Conservator's Report are worthy of attention. The total cost incurred amounted to R729.

Baluchistan.—Artificial re-stocking of areas, especially by the planting of fruit trees, was continued, and operations in the Shebo plantation appear to have been conducted with activity and success, although the season was unfavourable. Rupees 612 were expended on these works.

Andamans.—The plantation at Goplakabang was extended by 22 acres at the comparatively high cost of R1,177. The cultural operations of former years were reported to be doing well, but the area over which they have been successful has not been recorded. The system of introducing teak, and increasing the proportion of padauk in the forests by plantations in parallel lines some distance apart, should, if carried out systematically, prove more remunerative than the formation of regular plantations of mixed teak and padauk. It will be advisable to record the progress of these operations, which should be undertaken on a sufficiently large scale.

Berar.—The changes of area have been larger in these districts during the year than in any other locality with the exception of Bombay. The whole of the teak plantations of the Ellichpur Division, 1,409 acres in extent, have been struck off the returns, and it is not clear that the change was made with the sanction of the Chief Commissioner. The Government of India, in reviewing the Conservator's Report, while accepting the statement that many of the plantations were undoubted failures and that all had become merged into the natural forest, considered that any of them which, although not constituting independent regular plantations, served the purpose of aiding natural reproduction, and increased the proportion of teak in the Reserves, should still be borne on the registers under the head of "cultural operations." In like manner 9,906 acres have been written off under the head of cultural operations. In the absence of detailed explanation, it is at least possible that these sweeping exclusions may not have been limited to actual failures. The reasons given for these changes are not sufficiently explicit. The charges of the year amounted to R1,506.

Madras.—The net increase in the area of the regular plantations amounted to 607 acres and in that undergoing cultural operations to 753 acres. The amount expended during the year under review on these works, R51,702, was practically the same as during the preceding year. As remarked by the Board, the importance of artificial reproduction, as compared with natural, is small; yet it is comparatively rare that the improvement of the forests can be accomplished without some artificial aid by means of sowings or plantings, and the formation of large plantations or of smaller topes is of the greatest utility under certain circumstances. The amount expended on plantations, topes and other areas amounted to R32,656 and R19,045, in the Southern and Northern Circles, respectively.

Bombay.—Very large additions were made to the areas operated upon. The regular plantations were increased by 392 acres, while the area under cultural operations was added to to the very considerable extent of 37,765 acres. The chapter devoted in the Conservator's Report of the Northern Circle to artificial reproduction shows that 740 khandis of seed were sown broadcast, with considerable success. These works were to a great extent carried out by the protective establishment; cost little or nothing, and, if continued, must leave their mark in the constitution of the new crop. There can, however, be no doubt that the results would be more certain and speedy if the ground was previously prepared in the manner described in the Conservator's Report of the Southern Circle, even though the area operated upon might be much less extensive. The total expenditure under this head amounted to R18,550 during the year. Of this, R13,006 were spent in the Northern Circle.

VI.—Thinnings and Improvement Cuttings.

25. Operations of this nature are of infinitely greater importance and difficulty in the mixed woods of India, in which one or a few species only may be of sufficient value to permit of their systematic exploitation, than in the forests of Europe, where the removal of a few soft-wood trees solves the whole question, and where the price obtained for these leaves, in most cases, a profit on the cost of removal. The return of the work done during the year shows an improvement; but, excepting in the North-Western Provinces and the Pegu Circle in Burma, and to some extent the Central Provinces, the removal or killing of inferior species has, according to the reports submitted, not received that systematic attention to which its importance entitles it.

A considerable amount of work has been done in all Provinces as regards creeper-cuttings.

26. *Bengal.*—The cutting of injurious creepers, and the improvement of the forests by thinnings, received attention; and a considerable amount of work was done in this direction. The expenditure incurred under the sub-head of Account A.VIII. *f* was R1,326.

North-Western Provinces and Oudh.—Improvement fellings and the cutting of climbers were carried out over areas of 18 square miles in the Central and of 31½ square miles in the School Circle; but the area so treated in the Oudh Forests cannot be ascertained from the information furnished. The removal of inferior growth is next only in importance to protecting forests from injury from fire or other sources, for it is the most practical and economical method of improving the composition of the growing stock, and should receive greater attention and be carried out on a larger scale than has hitherto generally been the case.

Punjab.—Thinnings, or the removal of creepers or injurious shrubs, were undertaken in the Chamba, Kulu and Bashahr Divisions, with a view to facilitate the increase in size or reproduction of deodar. Greater efforts, however, should be made to carry out the provisions of working-plans in this respect. The total expenditure under A VIII. *f* amounted to R2,735.

Central Provinces.—In various Divisions, certain portions of forests were thinned of teak poles, or trees of inferior growth. These operations cost R1,168. It is stated by the Conservator that 4,81,840 climbers were cut at a cost of R327.

Burma.—Improvement fellings and girdlings were made in the Pegu Circle over an area of 21,411 acres at a cost of R4,881; but it appears that no similar operations were undertaken in the Tenasserim Circle. The weeding of plantations, it is gathered from the Conservators' Reports, was well carried out during the year under review. The desirability of improving the natural teak forests should be constantly kept in view. Too much importance, it need hardly be said, can scarcely be attached to the freeing of the seedlings from dominant bamboos and inferior species in plantations which have been artificially raised at considerable cost.

Nothing has been reported as having as yet been done in this direction in the Upper Burma Circle.

Assam.—Injurious climbers were cut over an area of 45 square miles, at an average cost of about R25 per square mile; and attempts were made in two Divisions to improve the stock in the forests by inducing purchasers to cut out unsound trees. Forest-weeding of this kind is important, and it should, if possible, be carried out on a very much more extended scale, as far as the available funds will permit, at least in all forests which are being exploited.

Coorg.—In this district weedings and the cutting of creepers were carried out over 1,092 acres at a cost of R307. The cost of these operations is moderate, and this cheap method of increasing the proportion of the more valuable species in the forests should, it is urged, be steadily pursued, due regard being had to local circumstances and sylvicultural requirements.

Ajmere.—No information on this subject has again been recorded for these forests.

Baluchistan, Andamans, and Berar.—No information has been furnished, and no work under this head would appear to have been undertaken during the year.

Madras.—In reviewing the work done in the Madras Presidency during the year 1888-89, the Government of India drew attention to the apparent neglect of any attempt to improve the condition of the forests by the comparatively inexpensive means of improvement and restoration fellings. The information furnished by Conservators for the year under review shows that but little advance was made in this direction, and it is, therefore, satisfactory to observe that the Madras Government has brought the matter to the attention of the Conservators.

Bombay.—Very little was attempted in this direction. In the Northern Circle, the eradication of the prickly pear in certain Reserves was carried out at a cost of R858.

CHAPTER III.

WORKING AND YIELD.

27. The following table shows, so far as it is possible to complete the information from Provincial Reports, the outturn of the various classes of forests :—

Outturn.

Province.	Reserved Forests.			Protected Forests.			Unclassed Forests.			Average outturn per square mile. Reserved Forests.			Protected Forests.			Unclassed Forests.		
	Timber and Fuel.	Bamboos.	Minor produce.	Timber and Fuel.	Bamboos.	Minor produce.	Timber and Fuel.	Bamboos.	Minor produce.	Timber and Fuel.	Bamboos.	Minor produce.	Timber and Fuel.	Bamboos.	Minor produce.	Timber and Fuel.	Bamboos.	Minor produce.
	C. feet.	No.	R	C. feet.	No.	R	C. feet.	No.	R	C. feet.	No.	R	C. feet.	No.	R	C. feet.	No.	R
Bengal	22,025,952	5,487,100	80,254	7,040,523	3,519,285	1,61,758	906,529	10,218,102	9,447	4,240	1,056	15	3,144	1,572	72	225	2,534	2
North-Western Provinces and Oudh	10,155,764	16,537,533	2,66,810	410,588	76,680	4,120	137,524	177,880	5,040	2,828	4,605	74	6,128	1,174	62	1,042	8,923	38
Punjab	4,652,680	643,906	1,15,454	3,096,910	...	1,23,443	19,267,871	36,615	1,94,786	2,747	380	68	8,651	...	345	4,915	9	50
Central Provinces	6,369,242	9,446,492	7,04,257	...	...	...	...	...	...	323	479	36	...	...	...	...	...	...
Burma (Lower)	(a) 1,744,582	2,229,510	90,644	...	...	...	(a) 9,516,495	...	69,557	313	400	16	...	...	...	[Area not known.]		
Burma (Upper)	...	...	...	10,647,979	14,030,132	1,38,931	...	...	...	...	...	...	1,197	1,577	16	...	...	...
Assam	1,419,309	1,333,910	4,122	544,746	1,822,700	6,005	3,053,572	1,095,343	57,629	409	384	1	584	1,956	6	546	196	10
Coorg	179,130	276,916	3,264	97,525	...	(b) 10,634	...	...	...	743	1,149	14	159	...	17	...	...	...
Ajmere	191,519	12,412	84,898	...	...	...	...	...	...	1,378	89	611	...	...	...	...	...	...
Baluchistan	...	...	...	...	...	...	(c) 1,141	...	603	...	...	...	...	...	...	29	...	15
Andamans	...	...	...	...	...	...	1,793,209	977,311	1,641	...	...	...	...	...	...	915	499	1
Berar	1,092,031	1,832,206	48,101	...	...	...	622,158	859,066	5,017	527	884	23	...	...	...	277	383	2
Madras (d)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bombay (e)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

(a) The total quantity of firewood used in the Tenasserim Circle cannot be given, as licenses were issued for the number of men engaged, and not for the quantity of wood consumed.

(b) A small portion of this was from Reserved Forests.

(c) In addition, 300 trees, 1,393 rafters, and 22,271 maunds of fuel, the cubic contents of which are not known.

(d) The forests in the Madras Presidency yielded 16,733,797 cubic feet of timber and fuel and R5,27,780 worth of minor produce (including bamboos). Dividing these figures by the 17,544 square miles under the Forest Department, a proportion is obtained of 954 cubic feet of timber and fuel, and R30 worth of minor produce per square mile respectively.

(e) The outturn of the forests in the Bombay Presidency amounted approximately to 31,468,106 cubic feet of timber and fuel, 5,908,469 (besides 8,234 cart-loads and 7,065 head-loads) of bamboos, and R6,52,609 worth of minor produce; and these figures, when divided by the total number (14,824) of square miles of forest in the Bombay Presidency, produce an outturn per square mile of 2,146 cubic feet of timber and fuel, 399 bamboos (not taking into account the cart and head-loads above mentioned), and R44 worth of minor produce, respectively.

Bengal.—The total quantity of timber and fuel removed from the forests was 29,973,004 cubic feet, as against 27,793,504 in the previous year. Minor produce. to the value of R2,51,459, was also removed. The removal of timber and bamboos by Government agency was less and that of fuel was greater than in 1888-89, while purchasers removed considerably more timber, fuel, bamboos and other produce. Free grants, aggregating 4,523,888 cubic feet of timber and fuel, 3,326,140 bamboos and R51,656 worth of other produce were given away. The total estimated value of these concessions was R76,413, of which all but a fractional part went to relieve distressed ryots and others in Orissa.

North-Western Provinces and Oudh.—Timber and fuel to the amount, respectively, of 4,291,848 and 6,412,028 cubic feet were removed from the forests during the year, being 44,424 and 770,786 cubic feet, respectively, in excess of the figures for 1888-89; 17,794,093 bamboos, or a decrease of 50,787 on previous returns, were also removed. Minor produce to the value of R2,75,970 was yielded by the forests.

The increase was due to larger removals of produce both by Government agency and by purchasers. The quantity of produce recorded as removed by free-grantees and right-holders was less than in the previous year, except in the case of fuel, of which a slightly larger quantity was removed. The decrease occurred chiefly in the Central Circle, where the quantity of timber removed declined from 316,223 cubic feet to 170,905 cubic feet.

Punjab.—The removals on account of timber, fuel and charcoal amounted to 27,017,461, cubic feet, being a decrease of 16,021,401 on the figures of 1888-89. The Conservator, however explained that it is difficult to compare the returns for both years, because those for the year under review are given in cubic feet, solid, instead of stacked. As regards bamboos, 680,521 were removed. The outturn of minor produce, including that granted free to right-holders, was valued at R4,33,683, being nearly 2½ lakhs less than in 1888-89. The reason for this decrease is due to the values of certain minor produce being estimated at a greatly reduced figure per unit of measurement.

Central Provinces.—Both the quantity of forest produce cut and removed by departmental agency and that removed direct by purchasers were less than in 1888-89; 1,147,089 cubic feet of timber and 5,222,153 cubic feet of fuel were turned out during the year, the respective decreases on the figures of the previous year being 177,082 and 53,742 cubic feet. Bamboos cut amounted to 9,446,492, or some 1½ millions below the preceding outturn. The removals of minor produce alone shewed an increase amounting to R47,408 on the figures for 1888-89. The question of rates to be charged for forest produce in each locality was under consideration during the year.

Burma.—In Upper Burma, there was an increase in the outturn on account of timber, fuel, bamboos and minor produce, amounting, respectively, to 2,035,289 cubic feet, 489,774 cubic feet, 3,335,176 and R72,745.

The increase under timber was due to the exceptionally favourable year, which enabled the Bombay-Burma Trading Corporation alone to extract no less than 131,565 tons.

The larger outturn of firewood and bamboos is accounted for by the better check resulting from a more stringent collection of dues.

Under minor forest produce the additional revenue is chiefly made up of collections on rubber, which had hitherto been credited to Land Revenue. Cutch brought in R51,000, which is not materially greater than the return of R46,000, obtained in the previous year; while the receipts from wood-oil were almost double.

In Lower Burma the outturn was largely in excess of that of the previous year. Of timber 10,643,708 cubic feet were removed, and of bamboos 2,229,510. Other minor produce removed was of the value of R1,60,201.

The floating season was very favourable, and the outturn of timber exceeded that of 1888-89 by more than 38,000 tons, notwithstanding that the outturn of that year had been the highest on record and in excess of the yield of the preceding year by nearly 34,000 tons. The extractions of teak aggregated 79,465 tons, while those of other woods reached 133,408 tons, making a total of 212,873 tons.

The quantity of teak timber worked out by purchasers, other than the lease-holders in the Tenasserim Circle, was more than 15,000 tons, as compared with 1,441 tons in the previous year. This is explained by the Conservator by the girdled timber having been sold standing in certain forests of the Toungoo District on terms similar to those granted to licensees of the ex-king in Upper Burma. Disposed of in this way, a price of R21 and R22½ per ton was realized, or more than double the amount charged on timber extracted from the greater part of the forests of Upper Burma under the agreements concluded with the holders of licenses obtained under the late Burmese Government.

The quantity of bamboos extracted from Reserves continued to increase steadily; and a specially noticeable fact is the marked falling off of the revenue from cutch from Unclassed

Forests. In 1888-89 these forests yielded R1,14,230, and only R66,195 during the year under review. The deficiency is at present being made up to some extent from the Reserves, which brought in an increased revenue from cutch of R56,000.

Assam.—The outturn during the year, not including free grants, from the forests of all classes was 1,751,086 cubic feet of timber and fuel, 2,080,168 bamboos, and minor produce worth R62,230. The free grants are roughly estimated to have included 3,266,541 cubic feet of timber and fuel, 2,171,785 bamboos, and R5,526 worth of minor produce. The total value of these grants was estimated at R1,22,803, as compared with R1,42,830 in the previous year.

The outturn was, as usual, felled and removed by purchasers for the greater part. Only 11,547 cubic feet of fuel and timber, 3,000 bamboos, and R308 worth of minor produce were extracted by departmental agency. Of the total yield, including free grants, considerably more than one-half was felled in the Unclassed Forests, which are only nominally, and for a time, under the management of the Forest Staff.

The total outturn (not including the free grants) was in excess of that of the previous year. That of *sál* timber, which is by far the most valuable produce of the forests, was 506,849 cubic feet, or 72,894 cubic feet more than in 1888-89.

Coorg.—The gross outturn during the year was as follows: timber 1,30,830 and fuel 1,45,825 cubic feet; bamboos 276,916, and minor produce to the value of R13,898.

The work done by departmental agency was considerably less than in 1888-89. It appears that work was restricted because the balance of wood in stock, which at the close of that year amounted to 57,370 cubic feet in depôt and 132,016 in the forests, total 189,386 cubic feet, was estimated to be equal to three years' sale requirements.

The adjustment of the timber accounts, by an enumeration of logs remaining in the forests from previous fellings, is doubtless, from the remarks made by the Deputy Conservator, an urgent work; but this could probably have been effected by departmentally collecting the logs by elephant or other dragging power at certain convenient points, without disorganising the ordinary work of the year, to which the people have now become accustomed.

Ajmere.—Timber, amounting to 5,619 cubic feet was removed during the year, the outturn under this head in 1888-89 having been *nil*. The output of fuel declined by 41,580 cubic feet, and the number of bamboos removed by 2,669. Minor produce, which was almost entirely grass, was removed to the value of R84,898, being R11,297 in excess of the figures for the previous year.

Baluchistan.—The outturn from these forests during the year is indicated in the above general statement, the minor produce extracted amounting in value to R603. It is hoped that there will be some sale of juniper from the Ziarat forests, as the Railway Department has discontinued cheap sales of fuel to the public.

Andamans.—Three hundred and thirty-two thousand seven hundred and thirty-three cubic feet of timber and 1,460,476 cubic feet of fuel were removed from the forests during the year. The outturn of the former was practically the same as in 1888-89; but the consumption of fuel rose by 394,512 cubic feet. Bamboos numbering 977,311 and minor-produce to the value of R1,641 were also extracted. A cargo of 670 tons of padauk was despatched to England, and 534 tons were ready for shipment when the year closed. The rates at which sales were effected were encouraging. There was a decline under local sales which was, however, only apparent, and is consequent on the Chatham saw-mill, to which sales of timber were formerly made, being placed under the Forest Department, which has not yet disposed of the converted material.

Berar.—With the exception of bamboos, there was an increase in the outturn of all material as compared with the figures of the previous year. This increase amounted, in the case of fuel, to 381,777 cubic feet, the total quantity removed having been 1,126,848 cubic feet. The outturn of timber was increased from 502,672 to 587,341 cubic feet. It is considered by the Local Government that the innovation of encouraging the public to purchase and remove material from the Melghât Reserves will probably lead to a further expansion of the outturn.

Madras.—Figures showing the outturn are given in the above general table which, on a comparison with that printed in the last Review, show that the quantity of timber and fuel removed declined by 1,934,419 cubic feet, and the value of minor produce by R21,159. These decreases are on account of produce removed by private agency. The quantity exploited directly by Government in the Southern Circle was largely in excess of the average.

Bombay.—The outturn from the forests of this Presidency is broadly indicated in the footnote to the above general statement.

CHAPTER IV.

FINANCIAL RESULTS.

29. The following table exhibits the Receipts and Surplus of the various Provinces during the year under review, as compared with the averages of the preceding five years:—

Province.	Revenue.		Surplus.		Deficit.		Proportion of Surplus to Gross Revenue.	Net Revenue per square mile of land under control of Forest Department.
	1889-90.	Average for preceding 5 years.	1889-90.	Average for preceding 5 years.	1889-90.	Average for preceding 5 years.		
	R	R	R	R	R	R	Per cent.	R
Imperial	4,759	6,503	..	...	76,552	77,633	...	...
Bengal	7,68,718	6,70,897	3,70,568	2,79,303	...	...	49	32
North-Western Provinces and Oudh . . .	17,14,159	14,91,893	7,51,008	5,85,385	...	...	44	198
Punjab	9,21,713	9,46,423	2,75,858	2,84,494	...	...	30	46
Central Provinces . .	11,56,181	10,84,852	4,59,736	5,12,291	...	...	46	23
Burma (Lower) . .	31,34,716	23,97,089	18,01,872	12,32,236	...	...	59	323
Burma (Upper) . .	18,06,070	*12,27,625	15,32,270	*8,34,264	...	...	85	172
Assam	3,79,498	2,71,872	1,22,369	48,330	...	...	32	12
Coorg	92,753	1,08,928	20,333	35,928	..	...	22	24
Ajmere	11,592	12,086	...	...	1,109	4,811	...	...
Baluchistan . . .	13,897	12,534	.	...	4,065	4,535	...	..
Andamans . . .	1,62,195	85,629	67,220	30,079	...	...	41	34
Forest School . .	1,237	630	...	...	28,409	29,531	...	...
Forest Surveys (Imperial) .	220	204	...	...	20,968	24,546	...	...
Total . .	1,01,67,708	83,17,165	52,70,131	37,01,254	...	.	52	77
Berar	4,40,541	3,80,215	2,63,992	2,07,920		...	60	61
Forest Surveys (Berar) .	...	376	...	...	6,464	31,810	...	...
Total, Bengal Presidency .	1,06,08,249	86,97,756	55,27,659	38,77,364		...	52	76
Madras	15,57,627	13,78,623	3,96,390	2,58,155	...	...	25	23
Bombay	31,37,696	30,83,885	13,67,005	12,43,679	...	...	44	92
GRAND TOTAL .	1,53,03,572	1,31,60,264	72,91,054	53,59,198	...	...	48	69

* Average for three preceding years.

From a purely financial point of view the results are eminently satisfactory; but the fact must be faced that a much larger expenditure must be incurred on establishment, and that the subordinate establishment, especially in the Rangers class, which is the unit of all sound forest management, must be still considerably increased in numbers, and more money spent on cultural operations and improvement of the forests and on roads.

The surplus for each year during the last five years is shown in the following table:—

Year.	British Territories.				Berar.	Grand Total.
	Bengal Presidency.	Madras.	Bombay.	Total.		
	R	R	R	R	R	R
1885-86 . .	22,24,991	2,60,678	15,26,825	40,12,494	1,18,300	41,30,794
1886-87 . .	26,59,603	93,789	10,79,766	38,33,158	1,09,736	39,42,894
1887-88 . .	26,84,462	2,45,708	10,88,572	40,18,742	1,81,180	41,99,922
1888-89 . .	41,04,440	2,94,212	11,56,228	55,54,880	2,13,810	57,68,690
1889-90 . .	52,70,131	3,96,390	13,67,005	70,33,526	2,57,528	72,91,054

30. The following table contains an analysis of the revenue and expenditure, which is more accurate than statements based on Form No. 62—a Form

which, for statistical use, is too malleable, owing to the discretionary distribution of the expenditure under Budget-heads A, III, V, VI, VII, and IX, and under the heads of B.

		R
Gross Receipts.	(a) Wood	1,17,11,838
	(b) Minor forest produce	13,63,716
	(c) Grazing	16,89,708
	(d) Revenue from forests not managed by Government	2,25,591
	(e) Miscellaneous	3,12,719
	TOTAL	1,53,03,572

				R	Proportion of Expenditure to Gross Receipts. Per cent.
Expenditure	A—Recurring	(a) Administration	(i) Superior staff	16,69,170	10·9
			(ii) Subordinate Staff (including Rangers, Foresters and Forest-guards)	12,21,932	7·98
			(iii) Cost of offices (including contingencies)	5,58,155	3·65
		(b) Working	(i) Cost of extraction	28,44,171	18·59
			(ii) Roads and buildings	2,83,829	1·85
			(iii) Fire-protection	1,79,083	1·17
			(iv) Cultural operations	2,87,528	1·88
			(v) Live-stock, stores and plant	1,90,544	1·25
			(vi) Working-Plans	45,143*	·29
			(vii) Rent for Leased Forests	1,04,869	·7
			(viii) Miscellaneous	93,319	·61
		(c) Expenditure on realization of revenue not managed by Government		11,358	·07
		(d) Forest Science and Education (including all A and B charges, Forest School)		29,646	·19
		TOTAL		75,18,747	49·13
	B—Extraordinary.	(e) Forest Settlements (including compensation)		26,354	·17
		(f) Forest Surveys		3,66,976†	2·4
		(g) Forest demarcation		1,00,441	·66
		TOTAL		4,93,771	3·23
		Grand Total Expenditure		80,12,518	52·36
		Net Revenue		72,91,054	47·64
					100·00

* Exclusive of B charges.

† Includes R6,464 charged to Forest Surveys, Berar ("B Establishments").

31. *Bengal.*—The Revenue, which was again increased during the year under review, amounted to R7,68,718 as against R6,76,907 in 1888-89. The surplus also expanded from R3,00,637 to R3,70,568. This steadily increasing surplus indicates careful administration. Satisfactory results are noticeable in the increased receipts from the Sundarbans, in the profitable working of the Jalpaiguri Division, and in the reduction of the deficit in the Chota Nagpur Division. In Orissa, the prevailing scarcity necessitated continued relaxation of rules and concessions being made for the relief of the people.

North-Western Provinces and Oudh.—The gross revenue from the forests amounted to R17,14,159 as against R14,62,802 in 1888-89. The expenditure incurred was R9,63,151 as against R8,44,544 in the previous year. The surplus revenue was R7,51,008. The result, from a financial point of view, of the year's working has, therefore, been one of distinguished success. Both the gross receipts and the net surplus of all three Circles were higher than have ever been known before, and the latter, as will be seen from the statement in the Appendix to this Review, exceeded by R1,32,750 the surplus of 1888-89.

Although the expenditure has necessarily risen slightly from year to year with the increasing receipts, the latter have increased at a much faster rate, with the result that there has been a steady rise in the net surplus. It is necessary, however, to draw attention to the fact that the sum devoted each year to the organization and improvement of the forests, apart from that spent on timber works and operations connected with the realization of the material, has not kept pace with the improved revenue.

Punjab.—The financial results of the year's working coincide almost exactly with the averages of the past five years, but do not compare favourably with the figures for 1888-89.

The receipts were R1,24,055 less, the charges R51,970 more, and the surplus R1,76,025 less than in the preceding year.

Central Provinces.—The financial results during 1889-90 were somewhat less satisfactory than those for the previous year, owing to the quantity of produce sold having decreased. The receipts amounted to R11,56,181, being about R24,000 less than in 1888-89, while the expenditure rose from R6,68,697 to R6,96,445, and the surplus decreased from R5,11,708 to R4,59,736.

Burma.—In Lower Burma, the financial results for the year under review were the best on record. The revenue realized amounted to R31,34,716, being an increase of R5¼ lakhs on the figures of the previous year, while the surplus was R18,01,872 as against R13,77,361 in 1888-89.

These results, by which a net revenue was realized of some 4¼ lakhs in excess of that of the previous year, are due to the additional yield of the forests and the brisk demand at good prices which prevailed for teak during the greater part of the year. It is now so fully established that these forests can yield so much larger a return for the labour devoted to their management than any other of the Indian forests, that it is desirable to employ as large a percentage of the surplus as can reasonably be made available in bringing under a sound organization those forests which have not yet been surveyed or for which working-plans have not been prepared.

In Upper Burma, the results were more favourable than was anticipated, owing to the year having been an exceptionally good one for working and export. The gross revenue was R18,06,070, being an increase of R2,26,142 on the figures of 1888-89, while the charges were R5,11,329 less, or R2,73,800 in all. The net surplus rose from R7,94,799 to R15,32,270, being an increase of R7,37,471 on the previous figures.

Assam.—The financial outcome of the year's working was entirely satisfactory. The receipts totalled R3,79,498 or R75,616 in excess of the preceding figures. The expenditure incurred amounted to R2,57,129, and the surplus shewed an increase on that of 1888-89 of R28,392.

The gross revenue and the surplus were the highest yet realized in Assam; the surplus for the previous year, which until then was the highest recorded, being only R93,977, while the *average* surplus for the ten years 1879-80 to 1888-89 amounted to R25,000. This satisfactory improvement in the financial working in recent years can, in a great measure, be attributed to the development of the local and export trade in timber, but, in so far as it is the result of effective administration, is also creditable to the Forest Staff.

Coorg.—The receipts in this Province were R92,753 or R43,430 less than in 1888-89. The charges amounted to R72,420, or only R7,755 less than in the preceding year. The surplus was reduced by R35,675.

These figures shew that there was a considerable decrease both in the gross revenue and in the surplus realised during the year as compared with 1888-89. This decrease was attributed partly to the smaller demand for timber during the year under review as compared with the preceding two years, in which it was abnormally high owing to large buildings being under construction in Mysore. The average receipts for timber sold during the previous five years only amounted to R45,793, as compared with R43,560 in the past year and an average of R58,650 in the two preceding years.

A further cause of falling off in the revenue was the deferment of the collection of R10,000, representing the rent of Cardamom *malés*, and the non-realization of some other rents payable on the same account within the year. It was explained that with the low prices prevailing and the failure of the crop, the collection of the full demand was an impossibility.

Ajmere.—Although the revenue was lower during the year under review than during 1888-89 the expenditure was also less, so that the deficit on the year's working was considerably less than hitherto. It would appear that had the value of some grass supplied to the Military Department been realized, the receipts of the year would, for the first time since Forest Conservancy was undertaken in Ajmere, have exceeded the expenditure. Actually the financial results, compared with those of the previous year, were as follows: the revenue was R11,592 and the expenditure R12,701, the corresponding figures for 1888-89 being R13,574, and R15,676.

Andamans.—The financial results again showed an improvement which is proportionate to the yearly increasing outturn from these forests, and must be considered satisfactory. Receipts, charges and surplus all showed increases on the return for 1888-89, the figures for each being, respectively, R56,120, R37,680, and R18,440.

Baluchistan.—The results of the year's working were satisfactory. The receipts, compared

with the previous year, were increased by R8,229, while the charges were not swelled unduly. The net deficit was reduced by R6,26 1 on the figures for 1888-89.

Berar.—The results closely resemble those of the preceding year. The receipts amounted to R4,40,541, the charges rose from R1,70,212 in 1888-89 to R1,76,549, and the surplus amounted to R2,63,692.

Madras.—The financial results were satisfactory. The receipts amounted to R15,57,627, a substantial increase on the figures of the preceding year. The expenditure, which was R11,61,237, showed a reduction of R59,557 on the previous figures. The net surplus was increased by R1,02,178.

Bombay.—The revenue was the highest on record, and the surplus showed an increase on the figures of the previous year of R2,10,777, being the largest ever obtained, with the exception of that for the year 1885-86. The revenue and expenditure were, respectively, R31,37,696 and R17,70,691 as against R28,50,190 and R16,93,962, the corresponding figures of the preceding year.

CHAPTER V.

I.—Establishments.

32. The Forest Staff is as yet, though it absorbs 22·50 per cent. of the gross revenue, inadequate to cope with the work.

A further important increase in the staff of Upper Control will probably not be required for years, but it is necessary in almost every Province to add at once considerably to the number of Rangers and, to some extent, to the Protective Staff. The re-organization of the Subordinate Staff is now before the Government of India.

In order to attract a superior class of candidates, it has been found necessary to recommend that the Lower Control Staff of the Department shall only be entered through the class of Rangers, and that this class again shall, in future, only be open to passed students of the Forest School.

The students who attended the Forest School at Dehra Dun during the year numbered 72, of whom 29 followed each of the English courses, and 14 the two vernacular courses. Of 59 students who either passed out of the school or studied continuously during the year, 33 were deputed by Provincial Governments, 13 came from Native States, and 13 attended as private students.

Towards the close of the year a Conference, composed of the Officiating Inspector General, Colonel Bailey, R.E., the Officiating Director of the Forest School, and presided over by the Secretary to the Government of India in the Revenue and Agricultural Department, was held at Dehra to consider questions in connection with the management of the school. This Conference, amongst other important matters, resolved on the establishment of a Board of Control, which would arrange for the conduct of examinations by certain of its members, and decide from time to time questions regarding the curriculum of studies and other similar subjects.

33. *Bengal.*—A forester obtained during the year a certificate of rangership from the Dehra Forest School, where also two other foresters were sent for training, one of whom afterwards resigned. The Conservator reported that the class of subordinate officers appointed during the year was unsatisfactory. Not one was fitted to follow the school course, and, consequently, none were sent for training to Dehra. One ranger and several guards were prosecuted during the year for criminal breach of trust or other offences. Two cases of theft of Government money took place, one of which resulted in the murder of three forest guards.

North-Western Provinces and Oudh.—The Conservator reported favourably on the Range Officers of the School Circle, but remarked that the prospects of the foresters were hopeless, owing to their being passed over by rangers who, though of shorter service, had received training at the Forest School. The Local Government, however, remarked that the Conservator is not prevented from filling part of the rangerships by promotions from lower grades. The Oudh Circle was strengthened by the addition of two Sub-Assistant Conservators, and sanction was obtained to an increase in the subordinate establishment costing R4,920. This increase, however, proved insufficient. Two apprentices obtained rangerships from the school. In the School Circle, the subordinate staff was well reported upon generally, but three guards were prosecuted or dismissed for corruption.

The Conservators complained during the year of the increase of clerical duty, particularly as regards audit of accounts and statistical work, and the Local Government held that this state of things must be prejudicial to the main duties of the Forest Staff, *viz.*, their out-door duties.

Punjab.—The Conservator reported that there were fourteen officers for twelve executive charges, the Conservator's office and the Working-Plans Division; that on the departure of another officer on leave, a Sub-Assistant Conservator would have to be placed in charge of a Division; and that there was not a single European Assistant on river work—a state of things almost unprecedented. Two officers were on deputation, and one was employed on special duty in the forests of the Simla Hill States.

Central Provinces.—During the year the forest area in the province was formed into two Conservator's charges; and with one exception all Divisional charges were re-organised, being sub-divided into ranges, sub-ranges, and guard's beats. The Chief Commissioner remarked that a proper distribution of the duties of the staff underlay successful administration, and trusted that this had been provided for in the re-arrangement of charges.

It was reported that the staff of rangers was especially weak, only 28 out of 44 sanctioned appointments being filled.

Burma.—In Lower Burma it was reported that the West Salween Division continued to be, as in 1888-89, practically under the charge of a ranger. In Upper Burma a new Division, that of Katha, was formed during the year. Otherwise the charges remained as in 1888-89. One officer resigned his appointment.

Assam.—Nothing has been recorded in the Conservator's report regarding the sufficiency or otherwise of the establishment. It is said, however, that, with one trifling exception, no encroachments of any kind on the forests took place.

Coorg.—The Government of India, in reviewing the progress made, stated that the work done reflected credit on the forest staff. No change in the strength of the establishment took place during the year, but a proposal was under consideration for the re-organization of the subordinate staff under which the incorporation in the permanent ranks of the temporary employés who had been entertained for a number of years was advocated.

Ajmere.—But little information was recorded. It would appear that the establishment generally performed its duties satisfactorily.

Baluchistan and Andamans.—Nothing of special interest or importance has been recorded on this subject.

Berar.—An additional Sub-Assistant Conservator was added to the strength of the establishment, and proposals were submitted for the entertainment of another, and for the permanent posting to the province of two trained Forest Officers, instead of one as heretofore. The Conservator stated that the subordinate staff was below its proper strength, and that thus additional work was thrown on tehsil establishments.

Madras.—In the Northern Circle nothing especially noteworthy has been recorded. There were no material changes in the strength of the subordinate establishment; but it is stated that in many cases foresters had to hold charge of ranges which numbered in all 62. In the Southern Circle the latter state of things also exists, more than one-half of the ranges having been in charge of under-paid foresters, and in some cases even of guards. The Conservator states that the superior staff is equally weak, and points out that in some instances rangers had to be appointed to act as District Forest Officers. Proposals were under consideration for an increase in the establishment.

Bombay.—As regards the Southern Circle, little information was furnished. A Committee sat at Poona during the rains, and submitted a report to Government on the re-organization and training of the subordinate establishment generally for the three Circles. In the Northern Circle the controlling staff remained unchanged during the year. A Sub-Assistant Conservator was dismissed for gross neglect of duty. The total expenditure in this Circle upon all establishment during the year amounted to R4,55,835. In the Sind Circle the Conservator remarked on the inadequacy of the controlling establishment, and gave his opinion that two additional officers were absolutely necessary. One of the officers in independent charge was unacquainted with the English language.

II.—Experimental Cultivation of Exotic and other Trees.

34. The following extracts contain all information regarding experimental cultivation, which can be gathered from the Annual Reports:—

Bengal.—On information received from Japan, a number of cuttings of *Cryptomeria Japonica* were put out month by month, but of these only 27 survived. It is stated, as regards the transplants of mahogany, that those of 1887 were about 15 feet high, the plants set in 1889 being 4 to 8 feet high and doing well. Seed of *Pithecolobium Saman* was sown, and 89 healthy seedlings were planted out.

North-Western Provinces and Oudh.—In the Central Circle experiments carried out shewed that the yield of katha from trees considered unsuitable by manufacturers contained 30 per cent. less katha than the trees selected for katha-boiling. Nothing was recorded on such subjects in the other Circles.

Punjab.—From the Conservator's report it would appear that no new experiments were attempted. Only general remarks are offered regarding exotics introduced in former years.

Central Provinces.—Sowing of sandal seed was attempted in Seoni, but without success. An effort was made in the Bhandára Division to establish an evergreen belt of *Opuntia* and *Pongamia* along the boundary of one of the Reserves, but the results are not known.

Burma.—There is nothing of special interest to record in respect of this subject in the Lower Burma Circle. The interesting experiments recorded in the last Review as having been tried at Bernardmyo in Upper Burma were successful, a large number of European fruit trees being now established there. *Pinus longifolia* thrives, it is stated, at that place and at Mogok. Deodar and *Picea Smithiana* are reported as doing well, and ready to transplant, but *Abies Webbiana* makes no progress. Other species of Himalayan conifers were also reported to be doing well.

Assam.—There is nothing of interest to record under this heading.

Coorg.—No new exotics were introduced. It was reported that *Grevillea Robusta* continues to do well, and that *Cupressus Torulosa* and *Frenela Rhomboidea* are fairly successful. The casuarina is a failure except in sheltered localities.

Ajmere.—Bamboo seed was obtained from the Central Provinces, and germinated successfully, there being 1,000 plants, 6 inches to 1 foot in height, doing well. Of the surviving balance of the Basra dates, mentioned in the Review for 1888-89, only three survived.

Baluchistan.—Considerable success continues to be obtained in the cultivation of non-indigenous species. It is noted that of a large number of horse-chestnuts obtained from Simla, there has scarcely been a single failure. Eucalyptus, walnuts and pistachio are also thriving, but the Himalayan dates have not succeeded, owing to the dry climate. *Pinus longifolia* is also reported as being excessively difficult to rear. The sowings of plane seed were a failure.

Andamans.—Nothing in this direction appears to have been attempted.

Berar.—There is nothing to record under this head.

Madras.—An experiment was tried in Nellore with a view to transform parts of the casuarina plantations into a forest of indigenous trees. This experiment was partially successful. In the Nilgiris, 100 acres of the Kullar Reserve were planted up with mahogany, *Swietenia macrophylla*, teak and vengai. Mahogany previously planted was cleared of creepers, &c., and appears healthy. The cultivation of imported and bazar date-fruits, and of the carob, were successfully continued.

Bombay.—In the Southern Circle, nothing in the direction of experiments with exotics appears to have been attempted. In the Northern Circle the cultivation of non-indigenous species, introduced in former years, successfully proceeded, but the results of the experimental sowings of the date-palm have been variable. In Sind, no fresh work was undertaken, and it is stated that the experiments have, on the whole, been a failure.

III.—Exports of Forest Produce.

35. *Statement showing the sea-borne exports of Forest Produce from India to Foreign Countries in 1889-90.*

Articles.	Quantity in tons of 20 cwt., in the case of teak, cubic tons.		Valuation at port of shipment in 1889-90.	
	Average of five years, 1884-85 to 1888-89.	In 1889-90.	Total.	Per ton.
			R	R
Caoutchouc	401·69	496·7	11,37,498	2,290·1
Shell-lac	5,394·39	3,504·8	37,30,865	1,064·5
Lac-dye	34·18	16·45	8,677	527·5
Cardamoms	124·28	65·0	1,83,854	2,828·5
Sandalwood, ebony, and other ornamental woods	...	...	6,41,952	...
Cutch and Gambier	12,148·77	11,099·3	33,34,004	300·4
Myrabolams	31,645·	39,087·05	31,75,330	81·2
Teak	42,926·6	71,342·	76,29,981	106·9
Total in 1889-90	...	...	1,98,42,161	...
Total in 1888-89	...	...	1,77,48,432	...
Increase or decrease in 1889-90	...	...	+20,93,729	...

APPEN
STATE

Summary of the Revenue and Expenditure of the Forest

Budget Heads.	Imperial.	Bengal.	North-Western Provinces and Oudh.	Punjab.	Central Provinces.	Lower Burma.	Upper Burma.	Assam.	Coorg.	Ajmere.	Baluchistan.
	Bengal Presidency (British Territories).										
REVENUE.	R	R	R	R	R	R	R	R	R	R	R
I.—Timber and other produce removed from the forests by Government agency.	...	79,109	7,07,200	5,50,125	1,04,051	21,18,603	3,514	8,103	65,322	14	1,171
II.—Timber and other produce removed from the forests by consumers or purchasers.	4,759	6,56,469	9,30,993	3,28,418	10,06,753	6,98,414	17,75,092	3,21,679	21,035	10,538	3,539
III.—Drift and waif wood and confiscated forest produce.	...	11,970	20,140	20,165	4,221	1,27,663	12,041	2,511	...	...	93
IV.—Revenue from forests not managed by Government.	...	...	18,747	1,510	10,112	1,39,014	...	15,831	...	...	9,059
V.—Miscellaneous . . .	...	21,170	28,079	21,495	31,044	51,022	15,423	31,374	6,396	1,040	35
Total Revenue .	*4,759	7,68,718	17,14,159	9,21,713	11,56,181	31,34,716	18,06,070	3,79,498	92,753	11,592	13,897
EXPENDITURE.											
A.—Conservancy and Works.											
I.—Timber and other produce removed from the forests by Government agency.	...	51,371	3,80,098	2,51,166	30,696	7,45,361	1,165	4,319	22,457	5	627
II.—Timber and other produce removed from the forests by consumers or purchasers.	...	35,671	39,282	1,863	1,07,542	9,902	11,911	10,952	602	...	...
III.—Drift and waif wood and confiscated forest produce.	...	3,268	11,371	6,584	4	66,383	11,910	173	...	...	...
IV.—Revenue from forests not managed by Government.	...	...	3,340	...	...	7,090	...	511	...	...	...
V.—Rent of leased forests, and payments to shareholders in forests managed by Government.	...	...	11,653	36,086	251	...	..	...	...	...	...
VI.—Live-stock, stores, tools and plant.	...	19,370	18,031	2,870	11,809	33,301	31,929	21,409	1,500	50	96
VII.—Communications and buildings.	...	21,594	98,091	12,025	6,090	14,562	17,474	20,540	1,843	340	130
VIII.—Demarcation, improvement and extension of forests.	..	40,158	83,348	47,758	1,48,142	1,50,136	10,967	59,316	17,210	1,033	1,456
IX.—Miscellaneous . . .	...	4,723	8,938	1,483	4,820	11,079	1,039	11,010	457	16	2
Total Conservancy and Works .	...	1,76,155	6,54,152	3,59,835	3,09,354	10,37,814	86,395	1,28,290	44,069	1,444	2,311
B.—Establishments.											
I.—Salaries	44,980	1,82,561	2,58,645	2,34,015	3,45,907	2,46,112	1,54,588	1,05,896	24,406	9,655	12,831
II.—Travelling allowances . .	8,126	31,441	34,679	34,025	22,067	30,456	28,731	17,413	2,797	1,193	2,494
III.—Contingencies . . .	3,155	7,993	15,675	17,980	19,117	9,462	4,086	5,530	1,148	409	326
Total Establishments .	56,301	2,21,995	3,08,999	2,36,020	3,87,091	2,95,030	1,87,405	1,28,839	28,351	11,257	15,651
Charges in England . .	17,260		...	...	...	...	...	...	...	...	...
Exchange on England .	7,750		...	...	...	...	...	...	...	...	...
Grand Total of Expenditure.	† 81,311	3,98,150	9,63,151	5,45,855	6,96,445	13,32,844	2,73,800	2,57,129	72,420	12,701	17,962
Surplus .	...	3,70,568	7,51,008	2,75,858	4,59,736	18,01,872	15,32,270	1,22,369	20,333	...	...
Deficit .	76,552	...	...	...	...	...	...	...	...	1,109	4,065

* Includes certain undistributable

† Includes pay of Inspector General of Forests, certain Home

DICES.

MENT I.

Department in India for the year 1889-90.

Andamans.	Forest School.	Forest Surveys (Imperial).	Total Bengal Presidency (British Territories).	Madras.	Bombay.	Total British Provinces.	Berar.	Forest Surveys (Berar).	Grand Total.	BUDGET HEADS
R	R	R	R	R	R	R	R	R	R	REVENUE.
1,60,325	...	...	37,97,537	3,38,744	15,82,876	57,19,157	.	...	57,19,157	I.—Timber and other produce removed from the forests by Government agency.
1,858	...	...	57,59,547	11,66,957	14,47,629	83,74,133	4,39,033	...	88,13,166	II.—Timber and other produce removed from the forests by consumers or purchasers.
...	...	...	2,07,804	15,793	8,521	2,32,118	821	...	2,32,939	III.—Drift and waif wood and confiscated forest produce
...	...	...	1,94,273	80	31,288	2,25,591	...	...	2,25,591	IV.—Revenue from forests not managed by Government.
12	1,237	220	2,08,547	36,103	67,382	3,12,032	687	..	3,12,719	V.—Miscellaneous.
1,62,195	1,237	220	1,01,67,708	15,57,627	31,37,696	1,48,63,031	4,40,541	...	1,53,03,572	Total Revenue.
										EXPENDITURE.
										A.—CONSERVANCY AND WORKS.
66,321	...	...	15,53,586	1,63,501	6,63,584	23,80,671	...	...	23,80,671	I.—Timber and other produce removed from the forests by Government agency.
58	...	...	2,17,783	78,825	34,606	3,31,214	28,451	...	3,59,665	II.—Timber and other produce removed from the forests by consumers or purchasers.
...	...	...	99,693	3,978	164	1,03,835	.	...	1,03,835	III.—Drift and waif wood and confiscated forest produce.
...	...	...	10,941	...	417	11,358	...	...	11,358	IV.—Revenue from forests not managed by Government.
...	...	...	47,990	16,521	24,800	89,311	15,558	...	1,04,869	V.—Rent of leased forests and payments to shareholders in forests managed by Government.
15,800	1,003	1,637	1,58,865	24,394	4,071	1,87,330	4,217	...	1,91,547	VI.—Live-stock, stores, tools and plant.
182	...	...	1,92,871	59,937	9,523	2,62,331	21,498	...	2,83,829	VII.—Communications and buildings.
1,201	...	1,153	6,61,878	2,40,139	1,86,811	9,88,828	10,233	...	9,99,061	VIII —Demarcation, improvement and extension of forests.
464	2,637	10	46,678	12,682	10,823	70,183	763	...	70,946	IX.—Miscellaneous.
84,026	3,640	2,800	28,90,285	5,99,977	9,34,799	44,25,061	80,720	...	45,05,781	Total Conservancy and Works.
										B.—ESTABLISHMENTS.
9,680	21,765	13,483	16,64,524	4,41,764	6,85,122	27,91,410	77,902	6,464	28,75,776	I.—Salaries.
1,226	2,235	2,345	2,28,268	96,249	1,02,068	4,26,585	12,716	...	4,39,301	II.—Travelling allowances.
43	2,006	2,560	89,490	23,247	48,702	1,61,439	5,211	...	1,66,650	III.—Contingencies.
10,949	26,006	18,388	19,82,282	5,61,260	8,35,892	33,79,434	95,829	6,464	34,81,727	Total Establishments.
...	...	...	17,260	...	...	17,260	...	..	17,260	Charges in England.
...	...	..	7,750	...	...	7,750	..	...	7,750	Exchange on England.
94,975	29,646	21,188	48,97,577	11,61,237	17,70,691	78,29,505	1,76,549	6,464	80,12,518	Grand Total of Expenditure.
67,220	...	...	52,70,131	3,96,390	13,67,005	70,33,526	2,63,992	...	72,91,054	SURPLUS.
...	28,409	20,968	...	...		...	...	6,464	...	DEFICIT.

and petty local items.
charges, and undistributable and petty local items.

STATEMENT II.

Financial Results of Forest Administration in India for the year 1889-90.

Province.	Timber and other produce removed from the Forest by Government agency.			Other Revenue.			Formation, Protection, and Improvement of Forests.	Total.		
	Receipts.	Charges.	Surplus or Deficit.	Receipts.	Charges.	Surplus or Deficit.	Charges.	Receipts.	Charges.	Surplus or Deficit
	R	R	R	R	R	R	R	R	R	R
Bengal	87,776	70,725	17,051	6,80,942	1,50,480	5,30,462	1,69,060	7,68,718	3,90,265	3,78,453
North-Western Provinces and Oudh	7,20,716	4,46,648	2,74,068	9,93,443	2,19,643	7,73,800	2,93,692	17,14,159	9,59,983	7,54,176
Punjab	5,70,288	3,90,608	1,79,680	3,51,425	99,399	2,52,026	1,55,848	9,21,713	6,45,855	2,75,858
Central Provinces	1,04,051	56,431	47,620	10,52,130	3,00,090	7,52,040	2,64,207	11,56,181	6,20,728	5,35,453
Burma (Lower)	21,79,963	9,18,136	12,61,827	9,54,753	1,68,712	7,86,041	1,91,735	31,34,716	12,78,583	18,56,133
" (Upper)	3,514	1,165	2,349	18,02,555	1,36,679	16,65,876	1,35,955	18,06,069	2,73,799	15,32,270
Assam	10,595	4,492	6,103	3,68,903	92,260	2,76,643	1,60,377	3,79,498	2,57,129	1,22,369
Coorg	65,322	33,156	32,166	27,431	5,984	21,447	33,280	92,753	72,420	20,333
Ajmere	14	5	9	11,578	4,518	7,060	8,178	11,592	12,701	—1,109
Baluchistan	1,171	771	400	12,726	7,753	4,973	9,438	13,897	17,962	—4,065
Andamans	1,60,326	93,717	66,609	1,869	57	1,812	1,201	1,62,195	94,975	67,220
Total	39,03,736	20,15,854	18,87,882	62,57,755	11,85,575	50,72,180	14,22,971	1,01,61,491	46,24,400	55,37,091
Berar	...	...	...	4,40,541	1,19,411	3,21,130	56,739	4,40,541	1,76,150	2,64,391
Total Bengal Presidency	39,03,736	20,15,854	18,87,882	66,98,296	13,04,986	53,93,310	14,79,710	1,06,02,032	48,00,550	58,01,482
Madras	3,38,744	3,23,676	15,068	12,18,883	4,07,520	8,11,363	4,34,162	15,57,627	11,65,358	3,92,269
Bombay	15,83,703	8,20,921	7,62,782	15,54,274	1,68,915	13,85,359	7,75,323	31,37,977	17,65,159	13,72,818
Grand Total	58,26,183	31,60,451	26,65,732	94,71,453	18,81,421	75,90,032	26,89,195	1,52,97,636	77,31,067	75,66,569

STATEMENT III.*

Revenue, Expenditure, and Surplus of the Forest Department throughout India during the 26 years from 1864-65 to 1889-90.

REVENUE.

Provinces.	1864-65.	1865-66.	1866-67.	1867-68.	1868-69.	1869-70.	1870-71.	1871-72.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80	1880-81.	1881-82.	1882-83	1883-84.	1884-85.	1885-86	1886-87.	1887-88.	1888-89.	1889-90.
	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R *
Imperial† .	421	30,959	752	543	1,159	1,438	3,107	2,334	2,771	1,225	1,144	1,465	2,490	1,36,772	16,716	17,214	18,887	27,407	30,732	32,907	26,574	14,706	4,186	4,847	4,017	4,759
Bengal . .	19,760	38,658	45,590	56,039	70,715	2,44,657	1,03,249	1,44,719	1,49,852	1,79,366	1,85,932	1,98,274	2,22,401	4,26,228	4,16,027	4,49,524	5,61,340	6,33,734	6,93,959	6,94,334	5,71,152	5,97,432	6,53,634	6,57,794	6,76,907	7,63,718
North-Western Provinces and Oudh . .	7,23,440	7,31,382	7,79,201	5,84,503	7,85,210	8,32,945	4,24,257	11,70,900	19,39,115	19,32,677	13,63,358	12,64,356	11,50,671	12,03,108	11,26,755	10,39,966	9,42,228	10,66,094	10,13,403	16,11,383	15,72,319	14,61,495	15,73,556	12,47,454	14,62,802	17,14,159
Punjab . .	5,27,081	3,50,680	3,96,050	2,80,510	3,44,882	3,94,129	9,47,236	7,10,216	6,52,995	7,32,539	8,34,874	9,09,831	5,98,754	6,83,711	5,00,619	6,49,819	6,71,678	6,88,308	7,66,709	9,10,177	7,49,352	8,50,419	11,27,277	7,86,936	10,45,768	9,21,713
Central Provinces . .	68,760	1,34,042	2,37,472	3,49,490	3,50,536	4,16,020	6,58,120	5,57,128	4,81,673	5,63,367	6,60,938	7,26,176	6,61,326	6,83,910	8,52,862	10,06,724	8,50,139	11,72,884	9,77,647	9,94,769	10,27,202	10,36,894	9,57,310	10,93,369	11,80,405	11,56,181
Burma (Lower)	9,34,070	8,98,485	4,24,774	6,46,812	8,17,599	9,84,774	8,18,124	7,72,400	8,27,569	10,68,621	10,74,802	17,79,020	15,51,408	16,03,062	11,37,562	11,80,190	15,16,613	22,31,804	25,03,896	25,09,275	16,70,982	20,23,859	19,98,667	22,18,897	26,09,305	31,34,716
,, (Upper)	...	.	...	..	...	...	...		.	. .	...	...	...	...	...	...	..	...	...	...	...	...	1,08,078	2,96,876	15,79,928	18,06,070
Assam . .	...	...	...	..	...	...	...	..	...	...	65,949	61,879	81,568	1,34,326	1,61,779	1,64,335	1,68,997	1,66,054	2,48,605	2,11,445	1,80,414	1,96,656	2,12,011	2,67,312	3,03,882	3,79,498
Coorg . .	57,488	1,01,157	32,508	79,082	98,496	1,08,135	72,144	92,466	84,425	1,10,284	58,015	1,07,460	75,927	1,01,015	52,020	1,01,786	87,857	1,00,364	1,38,022	87,822	1,13,233	89,386	99,291	1,27,028	1,36,183	92,753
Ajmere . .	...	...	...	...	...	...	...	...	24	304	203	410	905	3,002	1,241	1,861	1,124	4,065	7,126	8,198	10,456	9,697	11,274	14,293	13,574	11,592
Forest Surveys (Imperial) .	...	...	...	.	...	...	...	...	...	..	.	21	..	...	63	38	272	...	348	36	234	202	241	40	315	220
Forest School .	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	.	73	273	415	777	449	1,237
Andamans .	2,808	2,515	3,495	6,070	5,071	3,036	7,373	5,880	6,862	4,184	5,516	5,363	4,679	1,301	5,564	2,437	27,734	48,407	70,858	24,782	22,213	23,944	31,870	1,04,062	1,06,075	1,62,195
Total .	23,33,828	22,87,878	19,19,842	20,03,049	24,73,668	29,85,132	30,33,610	34,56,043	41,45,286	45,97,567	42,50,730	50,54,248	43,50,129	49,76,455	42,71,208	46,13,894	48,46,869	61,39,121	64,51,305	70,85,108	59,44,204	63,04,965	67,77,906	68,19,685	81,19,610	1,01,53,811
Madras . .	4,49,770	4,76,674	4,48,110	5,81,342	5,29,185	6,97,699	5,33,412	5,76,261	5,95,188	6,13,653	5,14,401	6,77,873	5,92,573	5,50,310	6,08,788	6,28,188	7,36,880	8,06,908	9,06,442	9,53,704	11,66,916	11,98,656	12,46,911	13,74,920	15,15,006	15,57,627
Bombay . .	10,81,907	10,07,611	8,21,268	8,84,244	12,13,483	12,35,257	11,68,401	11,50,215	11,46,405	11,88,089	12,24,051	12,48,672	12,26,658	12,61,528	11,81,894	15,24,712	15,22,807	18,28,117	20,90,353	25,03,100	27,74,842	33,66,286	30,32,676	30,32,577	28,50,190	31,37,696
Total (British India) .	38,65,505	37,72,163	31,89,220	34,68,635	42,16,336	49,18,088	47,35,423	51,82,519	58,86,879	63,99,309	59,89,182	69,80,791	61,69,360	67,88,293	60,59,890	62,64,774	71,05,556	87,74,146	94,48,100	1,05,41,912	98,85,962	1,08,69,901	1,10,57,493	1,12,27,182	1,34,84,806	1,48,49,134
Berar . .	2,368	15,106	43,574	53,440	84,557	1,80,397	1,77,329	1,55,543	2,56,563	2,63,256	2,60,674	2,32,782	2,53,072	2,79,236	2,88,704	3,07,500	2,66,556	2,33,511	2,92,014	3,08,218	2,97,185	3,19,851	3,26,261	4,06,447	4,07,977	4,40,541
Forest Surveys (Berar) . .	...	...	...	...	...	...	...	...	...	...	.	...	...	...	...	...	...	...	...	...	934	631	651	596	...	...
Baluchistan .	...	...	...	...	...	...	...	...	...	.	...	...	...	...	...	...	14,376	18,616	5,039	4,752	6,089	14,962	14,081	14,063	5,668	13,897
Grand Total .	38,67,873	37,87,269	32,32,794	35,22,075	43,00,893	50,98,485	49,12,752	53,38,062	61,43,442	66,62,565	62,49,856	72,13,573	64,22,432	70,67,529	63,48,594	70,72,274	73,87,488	90,26,273	97,45,153	1,08,54,882	1,01,90,170	1,12,05,345	1,13,98,486	1,16,48,288	1,38,98,451	1,53,03,572

* The figures in this statement have been revised by the Comptroller and Auditor General.
† Includes certain home receipts and undistributable and petty local items

STATEMENT III—*continued.*

EXPENDITURE.

Provinces	1864-65.	1865-66.	1866-67.	1867-68.	1868-69.	1869-70.	1870-71	1871-72.	1872-73	1873-74.	1874-75	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.	1885-86.	1886-87.	1887-88.	1888-89.	1889-90.
	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Imperial* . .	44,207	16,981	32,078	38,924	33,007	54,106	51,423	66,530	67,150	79,216	81,210	48,239	44,004	98,099	63,956	73,810	65,291	77,635	87,258	98,266	96,306	88,245	86,299	78,626	86,199	81,311
Bengal . .	3,971	45,292	1,05,215	1,67,495	1,15,933	1,17,898	86,479	1,10,989	1,00,777	1,39,274	1,01,361	1,42,676	2,14,197	2,62,913	3,38,675	2,75,748	3,35,381	3,94,612	3,82,183	3,87,813	4,11,915	3,70,399	4,22,781	3,90,368	3,76,270	3,98,150
North-Western Provinces and Oudh . .	5,03,580	3,31,261	4,10,205	3,89,806	5,01,021	5,23,422	8,10,073	11,10,071	11,74,666	11,90,794	10,61,302	7,36,979	8,61,362	7,28,926	8,09,977	7,16,594	6,79,574	9,16,212	8,39,025	10,41,885	10,20,101	9,78,519	9,19,580	8,30,748	8,44,544	9,63,151
Punjab . .	5,78,616	2,71,369	2,63,373	2,88,029	3,17,634	7,41,432	11,95,655	7,07,619	8,90,369	6,11,556	6,58,983	5,56,911	5,25,659	5,20,631	5,23,554	4,80,676	4,95,368	5,16,269	5,60,750	6,53,146	5,58,070	6,75,483	7,16,510	6,77,912	5,93,885	6,45,855
Central Provinces . .	1,55,270	1,08,597	1,49,408	2,18,434	3,19,126	4,74,930	3,17,928	2,31,633	2,50,578	2,85,939	2,94,449	3,73,327	2,90,295	3,22,034	3,93,758	5,22,574	4,95,512	4,97,013	4,12,247	4,36,058	4,95,821	4,45,432	4,99,293	5,52,939	6,68,697	6,96,446
Burma (Lower)	2,62,930	3,11,941	2,86,993	3,30,526	4,24,333	4,22,106	4,00,851	3,79,217	3,36,759	4,75,304	6,63,547	8,15,659	10,05,554	8,58,231	7,18,402	7,53,490	7,12,568	11,50,224	12,28,955	12,17,824	12,12,233	11,50,952	10,75,830	10,32,694	12,31,944	13,32,844
,, (Upper)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2,188	1,21,125	7,85,129	2,73,808
Assam . .	...	...	...	...	...	...	...	...	...	...	60,367	63,397	80,520	1,01,153	1,26,028	1,32,829	1,42,725	1,65,361	1,71,823	1,99,562	1,97,699	2,11,494	2,12,287	2,26,892	2,09,905	2,57,129
Coorg . .	3,407	12,996	8,650	13,722	17,848	33,064	28,747	70,178	29,478	45,952	37,999	40,168	33,692	36,268	34,829	55,165	56,487	59,796	64,770	75,023	76,951	65,680	74,088	72,629	80,175	72,420
Ajmere . .	...	...	...	...	...	...	...	...	13,054	17,932	15,281	27,346	22,460	14,926	13,445	13,750	12,423	13,954	11,281	14,574	16,316	16,469	20,744	18,897	15,676	12,701
Forest Surveys (Imperia.) .	...	...	...	...	...	...	...	...	...	59,556	78,090	58,930	58,929	60,165	60,325	46,878	40,335	42,489	41,595	30,940	19,823	19,180	28,348	32,868	22,164	21,188
Forest School .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	22,568	24,239	30,831	33,129	32,961	29,646
Andamans .	..	...	...	...	...	150	...	1,651	1,896	...	...	...	1,307	1,096	...	7,177	2,160	2,306	1,840	12,161	22,760	37,035	25,769	62,679	57,298	94,975
Total .	15,51,981	10,98,437	12,55,922	14,46,936	17,28,902	23,73,109	28,87,156	26,79,888	28,64,728	29,05,523	30,54,589	28,63,632	31,48,279	30,04,442	30,82,949	30,72,691	30,37,324	38,35,871	38,01,740	41,67,252	41,50,563	40,79,137	41,14,548	41,31,532	50,04,844	48,79,615
Madras . .	2,64,780	3,51,392	3,42,827	4,02,674	4,01,617	4,21,316	4,47,267	3,91,921	5,48,746	4,74,920	5,95,941	5,92,039	6,35,360	5,65,624	4,95,914	5,48,527	5,19,270	6,03,419	6,45,352	7,86,733	8,96,505	9,37,972	11,53,122	11,29,212	12,20,794	11,61,237
Bombay . .	3,72,187	7,77,139	6,51,641	5,55,039	6,31,226	5,58,015	6,39,759	5,97,831	7,25,031	7,21,594	8,36,675	7,94,141	8,38,979	8,77,716	10,04,923	10,76,989	11,67,347	11,69,181	12,78,770	15,64,172	17,78,723	18,39,461	19,52,910	19,44,005	16,93,962	17,70,691
Total (British India) .	21,88,948	22,26,968	22,50,390	24,04,649	27,61,745	33,50,440	39,74,182	36,67,640	41,38,505	41,02,037	44,85,205	42,49,812	46,27,818	44,47,782	45,83,786	47,98,207	47,23,441	56,08,471	57,25,862	65,18,157	68,25,791	68,56,570	72,20,580	72,04,750	79,19,600	78,11,543
Berar . .	478	8,991	13,718	18,669	34,105	81,569	81,972	1,00,829	83,631	86,350	91,389	91,449	94,652	1,09,968	1,07,350	1,10,506	1,28,968	1,52,985	1,55,054	1,56,779	1,52,649	1,59,242	1,71,704	1,83,765	1,70,212	1,76,549
Forest Surveys (Berar) .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	15,043	34,804	42,940	45,472	42,098	23,955	6,464
Baluchistan .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	16,416	17,682	11,982	16,911	13,266	15,799	17,836	17,753	15,994	17,982
Grand Total .	21,89,426	22,35,959	22,64,108	24,23,318	27,95,850	34,32,009	40,56,154	37,68,469	42,22,136	41,88,387	45,76,594	43,41,313	47,17,470	45,57,750	46,91,136	48,08,713	48,68,825	57,79,138	58,92,878	67,06,890	70,26,510	70,74,551	73,55,592	74,48,368	81,29,761	80,12,518

* Includes pay of Inspector General of Forests, certain home charges, and undistributable and petty local items.

STATEMENT III—*concluded.*

SURPLUS.

Provinces.	1864-65.	1865-66.	1866-67.	1867-68.	1868-69.	1869-70.	1870-71.	1871-72.	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.	1878-79.	1879-80.	1880-81	1881-82.	1882-83.	1883-84.	1884-85.	1885-86.	1886-87.	1887-88.	1888-89.	1889-90.
	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Imperial*	—43,786	13,978	—31,326	—38,381	—31,848	—52,670	—48,316	—64,196	—64,379	—77,991	—80,066	—46,774	—41,514	38,673	—47,240	—56,596	—46,404	—50,228	—56,536	—65,359	—69,732	—73,587	—82,113	—73,779	—82,182	—76,552
Bengal	15,789	—6,634	—59,625	—1,11,456	—45,218	1,26,758	16,770	33,730	49,075	40,092	84,571	55,598	7,904	1,63,315	77,352	1,73,776	2,25,959	2,39,122	3,11,776	3,06,521	1,59,237	2,27,033	2,30,853	2,67,426	3,00,637	3,70,568
N.-W. Provinces and Oudh	2,19,860	4,00,121	3,68,996	1,94,697	2,84,189	3,03,523	-3,85,816	60,829	7,64,449	7,41,883	3,02,056	5,27,377	2,83,309	4,74,182	3,16,778	3,23,372	2,62,654	1,49,882	1,74,378	5,69,498	5,52,218	4,86,976	6,53,976	4,16,706	6,18,258	7,51,008
Punjab	—51,535	79,311	1,32,677	—7,589	27,248	-3,47,303	-2,48,419	2,597	-2,37,374	1,20,983	1,75,891	3,52,920	73,095	1,63,080	—22,935	1,69,143	1,76,310	1,72,039	2,05,959	2,57,031	1,91,282	1,74,936	4,10,767	1,09,024	4,51,883	2,75,858
Central Provinces	—86,510	25,445	88,064	1,31,056	31,410	—58,910	3,40,192	3,25,495	2,1.0 95	2,82,428	3,66,489	3,52,849	3,71,031	3,61,876	4,59,104	4,84,150	3,54,627	6,75,871	5,65,400	5,58,711	5,31,381	5,91,462	4,58,117	5,40,430	5,11,708	4,59,736
Burma (Lower)	6,71,140	5,86,544	1,37,781	3,16,286	3,93,268	5,62,668	4,17,273	3,93,183	4,90,810	5,93,317	4,11,255	9,63,361	5,45,854	7,44,851	4,19,160	4,26,700	8,04,045	10,81,580	12,74,941	12,91,451	4,58,749	8,72,907	9,22,837	11,86,203	13,77,361	18,01,872
,, (Upper)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1,05,886	1,75,724	7,94,799	15,32,270
Assam	...	...	...	...	...	...	...	...	...	...	5,582	—1,527	—8,952	33,173	35,751	31,506	26,272	693	76,782	11,883	—17,285	—14,938	—276	40,420	93,977	1,22,369
Coorg	54,081	88,161	23,856	95,360	80,648	75,071	47,397	22,288	54,946	64,332	20,016	67,292	42,235	64,747	17,191	48,621	31,370	40,568	73,252	12,799	36,282	23,696	25,203	54,399	56,008	20,333
Ajmere	...	...	...	...	...	...	...	...	—13,030	—17,628	—15,079	—26,936	—21,555	—11,924	—12,204	—11,889	—11,230	—9,889	—4,158	—6,376	—5,860	—6,772	—9,470	—4,604	—2,102	—1,109
Forest Surveys (Imperial)	...	...	...	...	...	...	...	...	...	59,556	—78,090	—58,909	—58,929	—60,165	—60,262	—46,840	—40,063	—42,489	—41,247	—30,904	—19,589	—18,978	—28,107	—32,828	—21,949	—20,968
Forest School	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	—22,495	—23,966	—30,416	—32,352	—32,512	—28,409
Andamans	2,808	2,515	3,495	6,070	5,071	2,898	7,373	4,229	4,966	4,181	5,516	5,363	3,372	295	5,564	—4,740	25,574	46,101	69,018	12,601	—547	—13,091	6,101	41,383	48,780	67,220
Total	7,81,847	11,89,441	6,63,920	5,56,113	7,44,766	6,12,023	1,46,454	7,78,155	12,80,558	16,92,044	11,98,141	21,90,614	12,01,850	19,72,013	11,88,259	15,35,203	18,09,045	23,03,250	26,49,565	29,17,856	17,93,641	22,25,828	26,63,358	26,88,152	41,14,766	52,74,196
Madras	1,84,990	1,25,282	1,05,283	1,78,668	1,27,568	2,76,333	86,145	1,84,340	46,442	1,38,733	—81,540	85,834	—42,987	—15,314	1,10,874	76,641	2,17,610	2,03,489	2,61,090	1,66,971	2,70,411	2,60,678	93,789	2,45,708	2,94,212	3,96,380
Bombay	7,09,720	2,30,472	1,69,627	3,29,205	5,82,257	6,79,242	5,28,642	5,52,384	4,21,374	4,66,495	3,87,376	4,54,531	3,87,679	3,83,812	1,76,971	4,47,723	3,55,460	6,58,936	8,11,583	9,38,928	9,96,119	15,26,825	10,79,766	10,88,572	11,56,228	13,67,005
Total (British India)	16,76,557	15,45,195	9,38,830	10,63,986	14,54,591	15,67,648	7,61,241	15,14,879	17,48,374	22,97,272	15,03,977	27,30,979	15,46,542	23,40,511	14,76,104	20,60,567	23,82,115	31,65,675	37,22,238	40,23,755	30,60,171	40,13,331	38,36,913	40,22,432	55,65,206	70,37,591
Berar	1,890	6,115	29,856	34,771	50,452	98,828	95,357	54,714	1,72,932	1,76,906	1,69,285	1,41,283	1,58,420	1,69,268	1,81,354	1,96,994	1,37,588	80,526	1,36,960	1,51,439	1,44,536	1,60,609	1,54,552	2,22,682	2,37,765	2,63,992
Forest Surveys (Berar)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	—15,043	—33,870	—42,309	—44,821	—41,502	—23,955	—6,464
Baluchistan	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	—2,040	934	—6,923	—12,159	—7,177	—837	—3,755	—3,690	—10,326	—4,065
Grand Total	6,78,447	15,51,310	9,68,686	10,98,757	15,05,043	16,66,476	8,56,598	15,69,593	19,21,306	24,74,178	16,73,262	28,72,262	17,04,962	25,09,779	16,57,458	22,57,561	25,17,663	42,47,135	38,52,275	41,47,992	31,63,660	41,30,794	39,42,891	41,99,922	57,68,690	72,91,054

* Includes [illegible] of Inspector General of Forests, certain home charges, and undistributable and petty local items.

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